ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

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YUKON AREA

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES (Continued)

APPENDIX TABLES

APPENDIX TABLES (Continued)

APPENDIX TABLES (Continued)

APPENDIX TABLES (Continued)

ATTACHMENTS

PREFACE

This report presents current and historical information concerning the management of commercial and subsistence fisheries in the Yukon area. Data from many special research projects are included in this report; complete documentation of these projects and results will be presented in separate reports.

Data presented in this report supercedes information found in previous management reports. An attempt has been made to correct errors in previous reports and previously unrecorded data have been incorporated into this report. The report is organized into the following major sections:

1. Area Introduction. This section presents a detailed description of the area, inhabitants, fishery resources, fisheries and management practices.

2. Area Report, 1986. This section presents a comprehensive report of the current year and makes comparisons with previous years.

In order to facilitate use of this report, tabular data has been separated into current year tables and appendix tables where annual comparisons are made. Upper Yukon area commercial chum salmon catches in current year and appendix tables report salmon sales in the round (whole fish) or as pounds of roe sold, as documented by fish tickets. Roe directed harvests of summer chum salmon through 1979 and fall chum salmon through 1986 were at levels which resulted in total carcass utilization by subsistence. Total utilization tables (commercial plus subsistence) were prepared by totaling commercial harvests of chum salmon in the round and subsistence chum salmon harvests for these years. Total utilization estimates of summer chum salmon from 1980 through 1986 were expanded from harvest information including commercial fish ticket information for pounds roe and numbers of fish in the round, subsistence harvest information, and sex ratio information from a Department operated fish wheel near Kaltag (1983-1985). The sex ratio information was used to expand commercial roe harvest receipts to account for males taken incidental to the roe directed commercial fishery.

The following is an explanation of how commercial fishing effort and catch per unit effort data, presented throughout this report, have been derived. Boat (or fisherman) hours have been computed, arbitrarily assuming that if a fishing boat delivers in any fishing period, it is fished the entire period for as many hours as were open to commercial fishing.

Catch per fisherman (or boat) hour is obtained by dividing the total fisherman hours into the catch for the corresponding period of time.

Total fishermen (or boats) is the total number of fishermen making deliveries, irrespective of how many deliveries were made or days fished during a particular "season". There are a number of fishermen who deliver only once or twice during the entire season. "Total days fished" is the total number of hours open for commercial fishing during the season divided by 24.

Historic catch trends of total utilization are documented in Appendix Table 1. Prior year Annual Management reports identify the catch as being taken for commercial or subsistence use, as well as to total utilization.

AREA INTRODUCTION

Description of Area

The Yukon management area includes all waters of the Yukon River and its tributary streams in Alaska and all coastal waters from Canal Point light near Cape Stephens southward to Naskonat Peninsula (Figure 7). The Yukon River is the largest river in Alaska, draining approximately 35 percent of the state, and is the fifth largest drainage in North America (Figure 1). The river originates in British Columbia, Canada, within 30 miles of the Gulf of Alaska and flows over 2,300 miles to its mouth on the Bering Sea draining an area of approximately 330,000 square miles. With the possible exception of a few fish taken at the mouth or adjacent coastal villages, only salmon of Yukon River origin are harvested in this area.

Fishery Resources

All five species of Pacific salmon are found in the Yukon River drainage (Figure 1) with chum salmon being the most abundant. It is estimated that chinook (king), coho, pink and sockeye (red) salmon follow in order of abundance.

Chum salmon are found throughout the Yukon River drainage. Summer and fall chum salmon are two distinct runs of chum salmon which enter the Yukon River. Summer chum salmon are chiefly characterized by: earlier run timing (early June-mid July), rapid maturation in freshwater, smaller size (average 6-7 pounds), and larger population. Summer chum salmon spawn primarily in run-off streams in the lower 500 miles of the drainage and in the Tanana River system (Figures 2, 3 and 4). Fall chum salmon are mainly distinguished by: later run timing (mid July-early September), robust body shape and bright silvery appearance, larger size (average 7-8 pounds) and smaller population. Fall chum salmon spawn in the upper portion of the drainage in streams which are spring fed, usually remaining ice- free during the winter. Major fall chum salmon spawning areas include the Tanana, Chandalar and Porcupine River systems and also various streams in the Yukon Territory including the main stem Yukon River (Figures 4, 5 and 6).

Chinook salmon of the Yukon River are the largest species ranging from 2-90 pounds and averaging 20-25 pounds (sampled from the commercial fishery, large mesh gill nets). Spawning populations of chinook salmon have been documented in the Archuelinguk River located approximately 80 miles from the mouth of the Yukon River and as far upstream as the headwaters of the drainage in the Yukon Territory of Canada, nearly 2,000 miles from the mouth (Figures 2-6). Chinook salmon enter the mouth of the Yukon River soon after breakup during late May-early June and continuing through mid-July.

Coho salmon enter the Yukon River during late July through mid- September, average about seven pounds in weight and spawn discontinuously throughout the drainage. The major coho salmon spawning concentrations documented to date occur in tributaries of the upper Tanana River drainage (Figure 4).

Pink salmon enter the lower river during late June-mid July, average approximately 3 pounds in weight and essentially spawn in the lower portion of the drainage (downstream of the village of Grayling) (Figure 2). Pink salmon have been caught in the main stem Yukon River upstream as far as Ruby (river mile 601). In recent years large runs of pink salmon have occurred during even numbered years (1982, 1984, and 1986).

Sockeye salmon are uncommon in the Yukon River and only a few individuals are caught each year. Sockeye salmon have been reported taken in the main Yukon River upstream to Rampart (mile 763). There have been reports of sockeye salmon spawning areas being located along the Innoko River drainage.

Herring are found in Hooper Bay, Kokechik Bay and Scammon Bay (Figure 21). Spawning populations occur primarily in the Cape Romanzof area (Kokechik Bay and Scammon Bay) where suitable spawning habitat is available (rocky beaches, kelp (Fucus). Spawning usually occurs from mid-May through mid-June.

Other species common to the freshwater and or coastal marine habitats include: sheefish, several species of whitefish, Arctic char, pike, lake trout, grayling, burbot, suckers, sculpins, blackfish, sticklebacks,

lampreys, smelt, capelin, and several species of cods, flatfishes, crabs, shrimps and mollusks (Table 1).

Water Quality

Water quality and spawning habitats in the area have been largely preserved in their original condition. Pollution, logging, dam construction and mining activities, except in a few locations, have been to date minimal or nonexistent. It remains to be seen what impact recent oil development activity will have on water quality and fishery resources in the area.

District Boundaries

Commercial salmon fishing is allowed along 1,200 miles of the mainstem Yukon River and the lower 200 miles of the Tanana River. The present district boundaries were established in 1961 and redefined in 1962, 1974 and 1978. The commercial fishing area is divided into six districts for management and regulatory purposes (Figure 7). The lower Yukon area includes the coastal waters of the area and that portion of the drainage from the mouth to Old Paradise Village, river mile 301 (lower three districts). The upper Yukon area is that portion of the drainage upstream of Old Paradise Village to the U.S./Canada Border including the Tanana River (upper three districts). The districts are further subdivided into 10 subdistricts and 25 statistical areas for management purposes. Figures 8, 9, and 10 show the lower three districts statistical area charts. Figures 11, 12, 13, and 14 show the upper three districts statistical area charts. Yukon River mileages are listed in Table 2.

Commercial Salmon Fishery History and Description

U.S./Canada-Treaty Negotiations

In the spring of 1985, the governments of the United States and Canada ratified the Pacific Salmon Treaty; although Yukon River fishery issues are not specifically addressed in this document, one provision of the treaty

required the two countries to begin negotiations regarding salmon stocks which originate in Canada.

Since that time, U.S. and Canadian delegations have met in briefing sessions and in four formal negotiation sessions. The U.S. delegation is composed of a Department of State attorney acting as Chief Negotiator, representatives of the Department of Fish and Game, USFWS, and NMFS, and 14 members of the public who represent subsistence and commercial fishing interests on the Yukon River.

Very little progress has been made in these negotiations because of sharp differences on questions whether a Yukon River agreement should be part of the Pacific Salmon Treaty and, more specifically, on questions of salmon allocation between the two countries.

One benefit of these negotiations is the formation of a Joint Technical Committee composed of fishery scientists from both nations. The work of this committee is resulting in the development and exchange of important fishery data and a better understanding of salmon conservation requirements.

Negotiations are scheduled to resume during the spring of 1987. The expected focus of these negotiations will be on the technical committee's report on identification of depressed stocks, escapement goals, and on stock rebuilding strategies.

Historical Catch Trends and Status of Stocks

The first recorded commercial salmon harvest in the drainage dates back to 1903 when 70,000 pounds of chinook and chum salmon were taken in the Yukon Territory, Canada. A commercial fishery for these species still exists in Yukon Territory, primarily downstream of Dawson.

The first recorded commercial salmon harvest in Alaska was in 1918 when Carlisle Packing Company operated a floating cannery at Andreafsky (now St. Marys). Relatively large catches of chinook, coho and chum salmon were made

during the first four years of this fishery. Since restrictions were placed only on commercial fishing inside the river's mouth, a majority of the catch was made in "outside" waters. Because of the existence of a large upriver subsistence fishery, the early commercial fishery met opposition and was closed completely during 1925-1931. Commercial fishing for chinook salmon was resumed at a much lower level in 1932, and this species has been taken commercially each year since then. Only chinook salmon were harvested on a sustained basis prior to statehood (1959). During the period 1918-1959 chinook salmon commercial catches averaged approximately 30,000 fish annually. Since 1921, commercial catches of chum and/or coho salmon have been made during 1952-54, 1956 and since 1961.

Since the 1950's commercial salmon fishing has been permitted only upstream from the mouth of the Yukon River and in the vicinity of Black River. During the 1954-1960 period, a 65,000 chinook salmon quota was in effect for the river. Of this total, not more than 50,000 could be taken below the mouth of the Anuk River, 10,000 in the area between the mouths of the Anuk and Anvik Rivers and 5,000 upstream from the Anvik River. During these years, fishing was allowed for five and one-half days a week until specific quotas were obtained.

Under new regulations established by the Department in 1961, the annual chinook salmon commercial harvest for the entire area averaged 104,280 for the period 1961-1970 (Appendix Table 2). This average compared to 63,023 for the previous period, 1952- 1960, represents an increase of 66 percent. During the period 1971-1976 catches declined, averaging 88,067 fish annually because of below average runs (except 1971) and regulatory restrictions. In 1975 the chinook salmon commercial catch of 63,838 was the smallest since 1960. Restrictions placed on the commercial fishery during the 1970's generally resulted in improved escapements. Above average escapements occurred in most streams during 1977-1981. In 1980 and 1981 record escapements were observed in the majority of the major index areas. During 1982-1986 chinook salmon escapements were below desired levels in upper Yukon (Yukon Territories) spawning areas and during most years (1982-1984) in middle Yukon (Tanana and Koyukuk River systems) spawning areas.

To optimally harvest all stocks it is necessary to know the total return drainage wide as well as the timing of various stocks which make up the total return and the contribution of these stocks to the various fisheries. Knowledge has recently become available in determining some of these factors through sharing of data from projects conducted by the Department and by the Canadian Department of Fisheries and Oceans (DFO) as established through the U.S./Canada negotiations regarding chinook and fall chum salmon.

Stock composition modeling, utilizing analysis of chinook salmon scale patterns collected from fishery and spawning ground samples since 1982, has provided for allocation of the catch to three general areas of origin. These areas of origin include: 1) lower - tributary streams which drain the Andreafsky hills, and Kaltag Mountains, 2) middle - tributary streams of the Tanana and upper Koyukuk Rivers, and 3) upper - mainstem Yukon River and tributary streams that drain the Canadian portion of the system.

D.F.O. conducts a chinook salmon tagging program capturing fish for tag application by fishwheel just upstream of the U.S./Canada border. Recapture is made upriver by the Canadian commercial fishery. An estimate was made based on the ratio of tag to untagged fish in the commercial catch. Escapement is the difference between the estimated number of fish crossing the border and all known harvests. The Department is currently in the process of reviewing this project and to date no major problems have been detected with the chinook salmon escapement estimates.

Scale pattern analysis information applied to escapement information of upper Yukon spawning areas provide for an estimate of stock specific total return and exploitation rates of Canadian origin chinook salmon. The exploitation of Canadian origin stocks was 84% in 1982, 78% in 1983, 67% in 1984 and 90% in 1985. These levels of exploitation are thought to be excessive. In order to maintain run size at current levels it is necessary to maintain an exploitation rate below 67%. This would allow at least 33% of the run to spawn. Through analysis of data it was determined that middle run chinook salmon return was of equal size composition, therefore, of equal

vulnerability to fisheries as upper area origin chinook salmon. This allowed for application of the upper area exploitation rate to be applied to middle run stocks to achieve an estimate of the middle run chinook salmon escapements for years tagging was conducted. It was estimated that middle run stocks underwent exploitation rates of 72% in 1982, 58% in 1983 and 78% in 1985. Lower run chinook salmon size composition was smaller than middle and upper area runs, and these fish were not susceptible to upper river exploitation, therefore, it was not possible to estimate exploitation rates of these stocks.

Since 1977, due to increased efficiency of commercial fishermen and in some years due to above-average run strength, commercial catches increased through 1985, averaging 130,360 fish annually (1977-1985). The greatest catch ever made in the area was 158,018 chinook salmon in 1981.

Chinook salmon of western Alaska origin have been intercepted yearly by the Japanese mothership and landbased gill net fisheries (Appendix Table 39). Revised estimates indicate an average of 141,000 chinook salmon were taken during 1975-1983. Yukon River chinook salmon comprised the majority of western Alaska stocks taken in the Bering Sea mothership catches. In 1980 a total of 438,000 western Alaska chinook salmon was estimated to have been taken in these fisheries which exceeded the domestic commercial catch in western Alaska that year.

Although reported foreign catches have decreased in recent years, it is believed that high seas fishing mortality including gillnet dropouts (estimated to be 30% of the reported catch in one study) and possible underreporting of catches result in continued losses of western Alaska fish.

The reported chinook salmon catch made by the Japanese mothership fishery in 1986 was 47,000 fish. This was considerably below the recent five and ten year annual catches of 86,000 and 174,000, respectively.

The incidental harvest of chinook salmon in foreign and joint venture trawl fisheries has decreased in recent years. A domestic factory trawl fishery

has been recently initiated in the southeastern Bering Sea, however, the incidental salmon catch is unknown.

Since statehood the Yukon River commercial chum salmon fishery has steadily developed especially during the 1970's. During the period 1961-1965 commercial catches averaged 25,448 while during the same period subsistence chum salmon catches averaged 416,585. During the period 1966-1970 subsistence catches decreased, averaging 217,951 chum salmon. As the subsistence fishery declined and regulations were relaxed, coupled with the expansion of the fall chum salmon commercial fishery, the commercial catches increased, averaging 145,505 during 1966-1970. The development of the summer chum fishery and expansion of the upriver commercial fishery resulted in commercial chum catches averaging 644,320 during the period 1971-1977. In response to chum salmon market conditions a roe directed commercial fishery was initiated during 1978 in conjunction with the previously established fishery with total commercial harvests averaging 146,262 pounds roe and 1,054,390 fish in the round during the period of 1978 to 1985. The largest chum salmon catch in the history of the Yukon River commercial fishery occurred in 1981 when 1,473,511 fish and 201,527 pounds roe were taken (Appendix Tables 3 and 4).

Prior to the mid-1960's summer chum salmon were used primarily for subsistence, mostly for sled dog food. As the snow machine replaced the dog sled, subsistence fishing for summer chum salmon declined. Beginning in 1967, commercial fishing restrictions regarding summer chum salmon have been liberalized as the dependence for subsistence declined. The Yukon River summer chum salmon commercial harvest has increased sharply as a result of regulation changes (e.g. mesh size specifications and earlier openings of the fishing season), increased fishing effort (including expansion of the upper Yukon fishery), the availability of processing and tendering facilities, higher prices paid to fishermen, the development of Japanese markets, and the occurrence of very large runs in recent years. In 1967 only 10,935 summer chums were taken commercially while in 1978 a record 1,052,295 fish and 25,761 pounds roe were taken (Appendix Table 3). Since the recent development of the fishery catches have averaged 759,873 fish and 139,102

pounds roe annually (1978- 1985). The majority of the harvest takes place in Districts 1, 2 (fish in the round only) and 4 (primarily roe).

The major summer chum salmon spawning tributaries include the Andreafsky and Anvik Rivers and several others upstream to and including those of the Koyukuk River drainage. Department tag and recovery population estimates indicated total runs of 3.2 and 1.6 million fish in 1970 and 1971, respectively. In 1975 the total Yukon River run was estimated in excess of 3.5 million fish based on documentation of commercial and subsistence catches and aerial survey estimates. In 1981, the Yukon River summer run was estimated in excess of 5.6 million fish. In the Anvik River, escapements of over 1 million summer chum salmon were estimated in 1975, 1981, 1985, and 1986. Overall, Yukon River summer chum escapements have been good in recent years.

The commercial fishery for fall chum salmon in the Yukon River began in the early 1960's; however, the fishery has only recently expanded (since 1969). During the 1961-1968 period, catches averaged 36,185 fish annually and since 1969 (1969-1985) catches have averaged 250,170 fish and 3,301 pounds roe (Appendix Table 4). The recent development of the fall chum salmon fishery is also reflected by corresponding increases in fishing effort and processing facilities. Because of their good quality (bright, silvery appearance, large size, robust body shape and high oil content), which is related to their destination to spawning areas in the upper portion of the drainage, fall chum salmon are in great demand and are harvested in all fishing districts. The majority of the fall chum salmon commercial catches are taken in the lower two districts (Appendix Table 4). The largest fall chum catch occurred in 1981 when 466,451 fish and 11,285 pounds roe were taken.

Fall chum salmon are of more importance for subsistence than summer chums in that portion of the Yukon River drainage upstream of the mouth of the Koyukuk River. It is estimated that fall chums comprise 60-75% of the total subsistence harvest in this area.

There is evidence that the early run (late July-early August) of fall chum salmon are bound for the Porcupine River system and Yukon Territory streams. The late run of fall chum salmon (mid- August-early September) are believed destined primarily for the Tanana River.

Run magnitudes, based on comparative catch data and limited escapement data, have fluctuated sharply depending on the brood year strength. Large runs were generally experienced in 1971, 1975, 1979, 1981, and 1985 while small runs occurred in 1973, 1976, 1980, 1982-1984 and 1986. Upper Tanana River drainage escapements in general appear more stable and experience less fluctuation than the Porcupine River and Toklat River systems. For example, aerial survey escapement estimates in the Fishing Branch River (Porcupine River drainage) have ranged from 78,600 (1975) to 5,600 (1984) and the Toklat River (upper area) have ranged from 96,600 (1979) to 3,300 (1982).

In order to obtain better understanding of fluctuations in fall chum salmon abundance, commercial and subsistence harvests in Alaska and Canada has been added to an escapement index of total return for Yukon River fall chum salmon for the years 1974 through 1986 (Table 36). The escapement index is defined as the escapement population estimated for the Sheenjek, Fishing Branch, upper Toklat and Delta Rivers combined. While each of these four components is a total season population estimate and not just a survey count, the combined estimate is still just an escapement index for the overall Yukon River drainage since many known fall chum salmon spawning populations are not included. Lack of a historical data base prohibits including such spawning areas as the Chandalar, Kluane, mainstem upper Yukon, mainstem upper Tanana Rivers, and several sloughs off of the Tanana River. Additional fall chum salmon spawning populations have been documented, and several areas are suspected. Therefore, the return index of fall chum salmon estimated by this technique is a minimum estimate while the calculated exploitation rate is a maximum estimate.

During the 1986 season an overall fall chum salmon guideline harvest range from 0 - 160,250 was in effect as implemented by the Alaska Board of Fisheries during their December, 1985 meeting. This guideline harvest range

reduction from the 145,500 - 320,500 range, which was in effect from 1979 to 1985, was made in anticipation of a poor return of fall chum salmon. Regulations affecting fall chum salmon harvest levels were initially introduced in 1974 when the Alaska Board of Fish and Game established quotas of 200,000 chum salmon for the lower three districts (combined) and 50,000 combined chum and coho salmon for the upper three districts.

Yukon River chum salmon, in addition to other western Alaska stocks, are intercepted by the U.S. South Unimak - Shumagin Islands commercial fishery in June as demonstrated by tagging studies. Annual (1970-1979) catches of this interception fishery average 277,000 chums. However in recent years catches have increased sharply: 1980 (528,000 fish), 1981 (575,000 fish), 1982 (1,094,000 fish), 1983 (784,000 fish), 1984 (337,000 fish), and 1985 (479,000 fish), and 1986 (344,000 fish).

Coho salmon runs of the Yukon River are of lesser magnitude than fall chum salmon and are taken incidental to the commercial fishery for fall chums. Coho catches have averaged 26,686 fish during the period 1971-1985 (Appendix Table 5).

Commercial salmon catches by district and/or statistical area since 1961 are presented in Appendix Tables 2-6,9,10, and 16-18.

The relatively recent development and expansion of the commercial salmon fishery has enabled many area residents to obtain a cash income. In recent years (1977-1985) fishermen have received approximately 6.8 million dollars annually (Appendix Table 24). The vast majority of commercial fishermen are Eskimo and Athabascan Indian residents of the Yukon River drainage.

Most fishermen operate small outboard powered skiffs of 18 to 20 feet in length and do not use gill net rollers, power reels, etc. of any type. In the Yukon area set gill nets, drift gill nets and fishwheels are legal forms of commercial salmon fishing gear.

The majority of the salmon catch is presently processed as a fresh/frozen product in contrast to earlier years when canning and salting were of greater importance (Appendix Table 23). Salmon are processed at shore-based or floating operations with a portion of the catch transported via aircraft outside the area for processing. In the upper Yukon area production of salmon roe (purchased directly from fishermen) has increased in recent years (Appendix Tables 3 and 4).

Lower Yukon Area

The lower Yukon area consists of three districts: District 1 (mouth to Anuk River including Black River), District 2 (Anuk River to Toklik), and District 3 (Toklik to Old Paradise Village) (Figures 8-10).

Since the onset of the commercial salmon fishing in 1918, the majority of the Yukon River harvest has occurred in the lower river area (primarily Districts 1 and 2) where fishing and processing effort is concentrated and fish quality is higher. Although the summer chum fishery has developed in recent years, the lower river fishery during June and early July is still primarily managed for the chinook salmon run.

Beginning in 1961, when chinook salmon catch quotas were eliminated for Districts 1 and 2, and continuing through 1981 these fisheries were regulated by scheduled weekly fishing periods. The "chinook salmon season" (unrestricted mesh size) in these districts usually opens by emergency order between June 5- 15 and is closed by emergency order during late June or early July depending on run timing and magnitude. Fishing time during the chinook salmon season was allowed for four days a week during 1961-1967, but was reduced to 3-1/2 days a week beginning in 1968, to 3 days a week in 1974 and to 2-1/2 days a week in 1977. Effective for 1982, fishing periods during the chinook salmon season in Districts 1 and 2 were established by emergency order (2 days a week). This was done to provide for adequate chinook salmon escapements in response to increasing fishing effort and efficiency.

Commercial fishing effort had increased sharply since 1961. License registration for set gill nets more than doubled while drift gill net gear tripled during the period 1961-1975 (Appendix Table 7). Set gill nets are commonly used near the river mouth, but drift gill nets are the predominant gear type elsewhere. The best measurement of effort is the number of commercial fishing gear operated each year since fishermen have commonly used more than one type of gear during the season (Appendix Table 8). With the advent of the Limited Entry program in 1976, fishing effort in terms of the number of participants has apparently stabilized but efficiency has

increased. In 1986 a total of 707 CFEC gill net permits were issued (Appendix Table 7).

Since 1971 Districts 1 and 2 commercial chinook salmon catches have averaged 108,484 fish annually (1971-1985) (Appendix Table 2). In 1981 the Board of Fisheries established a 60,000-120,000 chinook salmon guideline harvest range for Districts 1 and 2 combined.

In District 3 the commercial salmon fishing season also opens by emergency order and fishing is allowed under a schedule similar to Districts 1 and 2 until the 1,800-2,200 chinook salmon guideline harvest range is taken (Appendix Table 15).

Sale of other species of salmon captured during the chinook salmon season, excluding the 1920's, has been allowed only since 1967 in the area of the present lower two districts. The incidental catch of summer chum salmon was limited during the chinook salmon season as fishermen could use only gill nets of (eight inch minimum stretched mesh). However, beginning in 1970, each fisherman could substitute up to 50 fathoms of gill net of any mesh size in Districts 1 and 2. In 1973 all mesh size restrictions were lifted during the chinook salmon season (from June 1 through early July) in order to allow greater opportunity to use small mesh nets which are selective toward the more abundant summer chum salmon. The majority of fishermen continue to fish the larger mesh chinook salmon nets during the chinook salmon directed periods (unrestricted mesh size). Comparative lower Yukon area chinook and summer chum salmon catches by mesh size are presented in Appendix Table 11.

Since 1961 the commercial fishing season in the lower Yukon districts has been reopened following the closure of the chinook salmon season to allow for the harvest of fall chum and coho salmon. Prior to 1973, the closure between the chinook salmon (summer) and the fall chum - coho salmon (fall) seasons (during most of July and often late June) was primarily for the purpose of insuring an adequate supply of summer chum salmon for upriver subsistence fishermen. This closure also provided protection for the late stages of the chinook salmon run.

Subsistence fishing for summer chum salmon has declined in recent years and the Department has liberalized regulations to provide for harvest of summer chum salmon surplus to subsistence and escapement requirements. Concurrent with continuation of the summer season to increase harvest of summer chum salmon, a regulation was promulgated in 1973 specifying gill nets of only 6-inch mesh or less may be fished after a specified date in early July in Districts 1 and 2. Use of small mesh gill nets in early July allowed a greater harvest of summer chums and also minimized the chinook salmon catch (Appendix Table 11). Beginning with the 1976 fishing season a regulation was promulgated which established a flexible range of dates from June 27 to July 5 in Districts 1 and 2 (and July 5-15 in District 3) after which only gill nets of six inch maximum mesh size may be used. Effective for the 1985 fishing season a regulation was promulgated which eliminated specific dates and implemented emergency order authority in establishing restricted mesh size periods (six inch maximum) in Districts 1, 2, and 3. Additionally, the Board of Fisheries issued a directive to the Department to provide for special summer chum salmon directed fishing periods (6 inch maximum mesh size) prior to the end of the chinook salmon season if the summer chum salmon run is average or better in strength.

In recent years (1978-85) the lower Yukon area commercial summer chum salmon catch has averaged 625,905 fish annually (Appendix Table 3).

Fall chum salmon have been harvested in the lower Yukon area beginning in 1961. Since expansion of the fishery in 1969 lower Yukon area fall chum catches have averaged 199,533 fish annually (1969-85) (Appendix Table 4).

In 1974 a 200,000 fall chum salmon quota (after mid-July) was implemented for the combined lower three districts. Also, fishing time was reduced from four to three days a week in Districts 1 and 2. These actions were necessary to stabilize the catch in view of increased fishing effort and improved efficiency and to provide for a harvest in the newly established upper Yukon area fishery. In 1979 fishing time was reduced further to two days a week

and the 200,000 quota was replaced by a flexible guideline harvest range of 120,000-220,000 chum salmon.

Effective for the 1983-1985 seasons fishing time was regulated by emergency order in Districts 1, 2 and 3. Two-12 hour fishing periods per week were established by emergency order in Districts 1 and 2 except that fishing time remained at two days a week for set net fishermen in the lower portion of District 1 (Figure 15). Fishing time in District 3 was reduced from 3 to 2 days a week. Also a one week season closure in Districts 1, 2 and 3 during late July was established. Fishing regulations were further restricted by regulation through establishment of the Yukon River Fall Chum Salmon Management Plan for the 1986 season in anticipation of a very poor return of fall chum salmon. A season closure of July 15 was established to protect the early portion of the fall chum salmon run and to provide the Department an opportunity to evaluate run strength. Additionally, the guideline harvest range was reduced to 0 - 110,000 fall chum salmon for Districts 1,2 and 3. The commercial fishery was to be implemented by emergency order authority but under restricted period duration if sufficient fall chum salmon run strength was indicated.

The harvest of coho salmon in the lower Yukon area is incidental to the harvest of fall chum salmon with the season ending on achievement of the appropriate harvest of fall chum salmon. The coho salmon run peaks during mid to late August in the lower river. Lower Yukon coho salmon catches since 1971 have averaged 23,324 annually (1971-1985) (Appendix Table 5).

Nearly all of the lower Yukon River salmon catch is destined for markets as a fresh-frozen product. Freezer ships and barges are located in the vicinity of Emmonak and Mountain Village. Fresh salmon is transported by aircraft from St. Marys and Marshall annually, and from Russian Mission and the Paimuit-Holy Cross during some seasons for further processing. A hard salting operation is located at Black River.

Upper Yukon Area

For regulatory and administrative purposes, the upper Yukon area is divided into three districts: District 4 extends from Old Paradise Village upstream approximately 360 miles to the mouth of Illinois Creek near Kallands; District 5, from the mouth of Illinois Creek upstream to the U.S./Canadian border (approximately 550 miles), and District 6, the Tanana River drainage, of which the lower 225 miles is open to commercial fishing (Figures 11-14).

Prior to 1974 the upper Yukon area (above the confluence of the Koyukuk River) was designated as a single district (District 4). By regulation, commercial fishing was allowed 7 days per week until the quotas of 2,000 chinook salmon and 2,000 chum and coho salmon (combined) were taken. These quotas were established for the purpose of allowing a very limited commercial utilization which had occurred for many years.

In recent years, however, the upriver commercial fishery has expanded. Fishing effort nearly doubled from 1972 to 1973, and processors developed outside markets, due in part to the steadily increasing price of salmon the market was experiencing. In recognition of the developing upriver commercial fishery and the desire of fishermen in the upper portion of the drainage for increased participation, the Board of Fish and Game adopted several major regulation changes prior to the 1974 fishing season. These new regulations provided for substantial increases in the upriver catches, reduced gear conflicts and, at the same time, made provisions for allowing escapement needs to be met:

1. District 4 was reduced in size and redefined as that portion of the Yukon River drainage from the mouth of the Bonasila River to the mouth of Illinois Creek at Kallands.

2. Two new districts were added: Districts 5 and 6.

3. Salmon catch quotas were established for the upper Yukon area as follows:

a. District 4: 1,000 chinook salmon and after August 15, 10,000 chum and coho salmon combined for the area.

b. District 5: 3,000 chinook salmon and after August 15, 25,000 chum and coho salmon combined for the area.

c. District 6: 1,000 chinook salmon and after August 15, 15,000 chum and coho salmon combined for the area.

4. In Districts 4, 5, and 6 the weekly commercial fishing period was reduced from 7 to 5 days per week.

Since that time the Board of Fisheries has enacted a number of major regulation changes in the upper Yukon area:

1. Weekly fishing periods were reduced in all districts (except the upper portion of district 5) from 5 to 4 days per week, and split-period fishing schedules were established.

2. Chinook salmon and fall chum and coho salmon quotas were replaced by flexible guideline harvest ranges: District 4: 2,250-2,850 chinook salmon and 10,000-40,000 fall chum and coho salmon; District 5: 2,700-3,300 chinook salmon and 10,000-40,000 fall chum and coho salmon; and District 6: 600-800 chinook salmon and 5,500-20,500 fall chum and coho salmon.

3. District 4 boundaries were redefined and new subdistricts created to allow for stock-specific management of fall chum and coho salmon.

4. New subdistricts within District 5 were created to achieve better balanced harvests and escapements.

Because of the common origin of salmon stocks which are harvested throughout the length of the Yukon River, the commercial and subsistence fisheries in the middle and upper river districts cannot be considered separate or

distinct from those in the lower portion of the drainage. They do, however, differ in several important respects.

For reasons of relative abundance, flesh quality, and the existing regulation structure, the fall chum salmon run is the target species of the commercial fishery in Districts 5 and 6.

The summer chum salmon run is of paramount importance in District 4 and comprises the majority of the total upriver commercial harvest [78% of fish sold in the round, 98% of roe sales (1974- 1985 average)]. Unlike the lower river fisheries, relatively few summer chum salmon are taken commercially in Districts 5 and 6. Because of their low abundance, advanced state of sexual maturity, and consequent poor quality, the flesh is difficult to market; however, roe quality of summer chums is judged to be excellent.

Tradition, local fishing conditions, efficiency, and relative ease of operation combine to make fishwheels the primary type of gear for harvesting summer chum salmon and account for roughly 95% of the commercial harvest of that species in the upper Yukon area. In contrast, local river conditions and regulations dictate the exclusive use of set and drift gillnets in the lower Yukon area.

The last major difference between the two fisheries is their relative size, both in numbers of fishermen and catch. Because of the developing nature of the commercial fishery in Districts 4, 5 and 6 and the absence of major summer chum salmon producing streams in the upper portion of the drainage, the commercial salmon harvest has averaged approximately 9% of the total area harvest of fish sold in the round and 100% of the roe sales (1981-1985). During the same time period, the upper Yukon districts have had an average of 154 participating fishermen or approximately 19% of the Yukon area total (Appendix Table 7). Chinook salmon are of lesser importance to the commercial fisheries in the three upper districts; the total harvest guideline range allocated by the Board of Fisheries is 5,550 to 6,950 chinook salmon (Appendix Table 15). In most years the guideline harvest range is not met in District 4, as most fishermen choose to retain chinook salmon for

subsistence use. In the Tanana River (District 6), the upper end of the chinook salmon guideline harvest range is normally taken by late July, and in most years the season remains closed until early to mid- September. A relatively intense fishery for chinook salmon has developed in the lower portion of District 5, and considerable (gillnet) effort occurs during July.

The majority of commercially caught chinook salmon are transported to Fairbanks and other population centers for primary processing and sold to wholesalers outside the state as a fresh- frozen product. The balance of the chinook salmon catch is sold to local supermarkets and restaurants. Most fall chum salmon harvested in these districts are tendered by boat or single-engine aircraft from collection points along the river and are then trucked or flown to processing plants in Manley, Galena, or Nenana for processing. A portion of the fall chum harvest is marketed as a fresh-frozen product, and small quantities of chinook and fall chum salmon are smoke-cured and sold as "strips", a local specialty product. In addition, limited quantities of chum and coho salmon taken commercially are dried and sold as dog food.

The upper Yukon commercial fishery developed at a time (mid to late 1970's) when salmon runs on the west coast were generally depressed. For this reason, processors were able to overcome quality problems and transportation costs and find ready markets for their product. In recent years, however, salmon runs throughout Alaska have rebounded, and processors are now having to compete with higher quality sockeye and chum salmon. Prices paid for upriver chum salmon (primarily summer chum salmon) have not kept pace with inflation resulting in development of roe directed fisheries initiated in 1978 in some areas (particularly Subdistrict 4-A).

To varying degrees between years and districts, markets for chum salmon in the round remain available for higher quality male summer chum salmon and fall chum salmon (Appendix Tables 3,4, and 6). Carcasses resulting from roe directed fisheries appear to be fully utilized for subsistence purposes except for District 4 summer chum harvests since 1980. Total utilization of District 4 summer chum salmon harvest have been estimated since 1980 based on fish ticket sales (either in the round or as roe), estimated numbers of males

taken incidental to the roe directed fishery as documented by the Department operated fishwheel located near Kaltag from 1983 to 1985, and subsistence survey results. It is estimated that approximately 322,000 summer chum salmon have been harvested annually (1980-1985) from District 4 in association with the commercial fishery. It was estimated that the harvest of summer chum salmon in District 4 in 1986 was 465,535 (Appendix Table 6). A portion of the carcasses of this catch is utilized for subsistence, however, significant waste has been documented.

Subsistence Utilization

There are approximately 10,000-15,000 Eskimo and Athabascan Indian people in the area, the majority of whom reside in excess of 45 small villages scattered along the coast and major river systems. Nearly all of these native people are dependent to varying degrees on fish and game resources for their livelihood.

Subsistence fishermen operate gill nets largely in the main rivers and, to a lesser extent, in the coastal marine waters, capturing mainly salmon, whitefish and sheefish. Fishwheels take considerable numbers of salmon in the upper Yukon and Tanana rivers. Beach seines are occasionally used near spawning grounds to catch schooling or spawning salmon or other species of fish. Traps and fish weirs of various designs are also used, mainly in the fall and winter months, to capture whitefish, blackfish and burbot. Sheefish, pike, char and "tomcod" (saffron cod) are frequently taken through the ice by hand lines. Dip nets are used in late May-early June to take smelt in the delta area and in late October-early November to take lamprey in the main Yukon River downstream of Grayling.

There is usually little intentional wastage of the fish taken for subsistence purposes. The major portion is sun dried or smoked for later consumption while the head and viscera may be fed to sled dogs.

Comprehensive annual surveys of the Yukon River subsistence salmon fishery were initiated by the Department in 1961. Data obtained cannot be easily

compared with that of earlier years which was often incomplete or lacking for many years. Methods and coverage of these earlier surveys were not documented and their accuracy cannot be determined. However, there are records indicating that in excess of one million salmon (mainly chums) were taken for subsistence in some years during the early 1900's and even as late as 1940.

The Department's subsistence fishery surveys (personal interview, catch calendar, and/or catch questionnaires) obtain catch, effort and other associated data from villages and fish camps along the main river in Alaska, including portions of the Tanana River and Chandalar River. Survey methodology and technique has varied from year to year which influences subsistence harvest estimates, however, it is felt that estimates accurately reflect harvest trends. Catch data from the Canadian portion of the drainage has been supplied by personnel of Government of Canada - Department of Fisheries and Oceans (Whitehorse office) since 1962. In recent years, the Department has conducted surveys of Koyukuk River villages.

About 1930 the airplane began replacing the sled dog as mail and supply carrier, starting the gradual decline of the subsistence salmon fishery. Subsistence catches declined through the 1970's as increased welfare payments and employment opportunities, including commercial fishing activities, have become available to the native people. Declines in subsistence catch levels have varied by species. The reduction in subsistence fishing is not necessarily related to fish abundance, but mainly reflects decreases in effort and dependence due to a changing way of life.

To illustrate changes in effort, there were 393 fishwheels operated on the Yukon River in 1918. Fishwheels are very effective if fished properly. A single wheel is capable of taking up to 20,000 chum salmon annually. The number of fishwheels recorded during the 1970 survey was an all-time low of 56, a 67% decrease since 1961. However, because of the expansion of the upper Yukon commercial fishery, beginning in 1973, the amount of fishwheel gear used for subsistence has sharply increased (207 units in 1981).

Another very important factor tending to affect subsistence fishing effort during recent years is the increasing use of snow vehicles which may be replacing sled dogs at a faster rate than did the airplane. Since considerable numbers of salmon and other fish are fed to sled dogs, fewer fish are required for subsistence purposes as the canine population declines. In 1961 each fishing family kept an average of 7.7 sled dogs while in 1972 this figure was down to 3.8 sled dogs. However, due to the renewed interest in sled dog racing, the number of dogs per family increased to 6.8 in 1981. The number of snowmachines owned by fishing families was documented beginning with the 1967 season, when the average number of snowmachines per family was 0.4. By 1973 the number of snowmachines had increased to 1.1 per family and increased to 1.4 per family by 1977. The number of snowmachines per family remained within that range through 1982, after which time no records were maintained.

Reflecting the above changes in effort and dependency, the subsistence salmon catch has substantially decreased since the early 1960's. Comparing catches the harvest of salmon other than chinook (primarily chum salmon) averaged 416,585 fish during 1961-1965. During the period 1966-1973 catches averaged 209,636 fish, a decrease of 50 percent. However, during 1974-1983, subsistence catches increased, with the catch being utilized mainly for dog food, averaging 364,721 fish during this time period. This increase can be attributed to above-average size runs, especially summer chums, subsistence roe sales (legal 1974- 1977) and increasing numbers of recreational sled dog teams.

Subsistence catches of chinook salmon, which are utilized mainly for human consumption, remained relatively constant during the period 1961-1977, generally averaging 15,000-25,000 per year. During 1978 - 1985 chinook salmon catches have increased substantially, averaging approximately 37,000 fish per year.

The recent evolution of the upper Yukon and Tanana River subsistence fishery has also differed from that in the lower Yukon. Possibly because of the much older, larger and more sophisticated nature of the commercial fishery in the

Yukon Delta to Holy Cross area, a more pronounced dependence on a cash income has developed requiring lesser need of subsistence resources. In contrast, the recent development and limited nature of the commercial fishery in the middle and upper Yukon, the absence of other employment opportunities may have retarded the transition to a cash-based economy requiring need of subsistence resources. Additionally, subsistence use of resources by urban residents, partially due to easy road and river access, increases harvest levels of this area. For these reasons, it is speculated that residents of Yukon River villages and residents of associated urban centers in the Interior retain a greater degree of dependence on the salmon resources for subsistence purposes. This is illustrated by the catch data presented in Appendix Tables 27-31 which show that the majority of the subsistence salmon catches are taken in the upper Yukon River area.

It should be noted that the practice of keeping sled dogs is much more common in the upper Yukon than in the delta area and is considered a major factor affecting fishing effort. It is also likely that the sale of subsistence-caught salmon roe (legal from 1974-1977) increased subsistence chum salmon catches above normal food and domestic use requirements during that period. Subsistence roe sales were not considered a significant factor affecting domestic use harvests in the twelve major villages in the lower Yukon River area.

Subsistence fisheries which target on non-salmon species such as pike, sheefish and whitefish are inadequately documented and their overall significance is not well known. It is thought, however, that residents of the upper Yukon area are much less dependent on these miscellaneous species than are their downriver counterparts.

Escapement Enumeration

A vital link in responsible management of the Yukon River salmon fisheries includes determination of annual salmon spawning escapements. Knowledge of escapements possess several management applications, such as to:

- provide information for determining optimum escapement levels or goals for selected spawning areas or management units.

- provide annual escapement trends for evaluation of the effectiveness of the management program and, in turn, the basis for proposing regulatory changes and management strategies.

- provide information for use in forecasting returns.

The Yukon River drainage is too extensive for complete comprehensive escapement coverage during any given season. Consequently, low-level aerial surveys from single-engine, fixed- wing aircraft are the primary method used to obtain escapement information. However, comprehensive enumeration studies, by intensified ground surveys, counting towers, weirs, and hydroacoustic projects are also conducted. Regardless of the method utilized, the overall objective of escapement enumeration in the Yukon Management Area is to determine abundance (or often indices of relative abundance), timing, and distribution of spawning salmon populations throughout the drainage; realizing specific objectives may vary by individual project.

There are both advantages and disadvantages related to each type of enumeration method. The more comprehensive studies tend to provide estimates of total salmon escapements and are often less dependent upon weather and water conditions. However, due to costs associated with manning and operating such enumeration projects as intensified ground surveys, counting towers and hydroacoustic assessment, they have numbered relatively few and been restricted primarily to selected spawning streams, e.g., the Andreafsky, Anvik, Sheenjek, Salcha, and Delta rivers in Alaska and the Fishing Branch River and Whitehorse fishway in Canada.

Perhaps the greatest advantage of aerial surveys, as it pertains to the Yukon River drainage (330,000 square miles), is the cost- effectiveness of obtaining escapement information throughout an extremely vast area, most of which is remote. Another advantage to aerial surveillance is that real or

potential habitat-related problems arising from natural or man-induced causes can be readily identified. Among the disadvantages are that results may be highly variable if non-standardized procedures are used.

Variability in aerial survey accuracy is dependent upon a number of factors such as weather and water conditions (turbidity), timing of surveys with respect to peak spawning, type of aircraft, survey altitude, experience of both pilot and observer, and species of salmon being enumerated. It is generally recognized that aerial estimates are lower than actual stream abundance due to these factors. Further, peak spawning abundance measured by aerial survey methods is significantly lower than total season abundance due to the die-off of early spawners and arrival of late fish. Also, aerial estimates in a given stream may demonstrate a wide range in the proportion of fish being enumerated from year to year. Peak aerial counts, however, can serve either as indices of relative abundance for examination of annual trends in escapement or estimation of total escapement from base year data or established expansion factors, or they may be used to apportion tributary spawning distribution to a mainstem total escapement estimate obtained from sonar or tower counts.

Aerial escapement estimates are made of as many spawning streams as possible within the confines of fiscal, manpower, and weather restraints. Representative selected spawning streams or "index areas" have been identified and receive highest priority. Index areas have been designated due to their importance as spawning areas and for use in annual comparison with other unsurveyed streams in the general area. Escapement estimates of index streams not only provide yearly escapement trends but also allow for post-season evaluation of management strategies. Preliminary escapement objectives have been established for some tributary systems which represent the number of spawners considered necessary to maintain the reproductive potential of each stock (Table 17).

Management

The overall objective of the Yukon Area research and management programs is to manage the various salmon runs on an optimum sustained yield basis. Subsistence fishing has been designated by the Alaska State Legislature and the Board of Fisheries as the highest priority use, although, where the dependence upon subsistence fishing has declined, the Department has liberalized regulations to allow development of commercial fisheries.

Management is made difficult by the complexity of the salmon runs and fisheries in addition to the huge size of the drainage. Since most of the fisheries only became developed or expanded in recent years, there is a lack of adequate comparative catch and return data on which to evaluate the long term effects of increased commercial harvests. In contrast to other management areas in the state where intensive research studies have been conducted for many years, forecasts of actual numbers of salmon returning to the Yukon River system are not available. In addition, due to the character of the fishery (e.g. allocation problems within and between upriver and downriver fishermen), the salmon runs and of the Yukon River itself, effective management is restricted. For example, the various fisheries scattered over 1,400 river miles are harvesting mixed stocks usually several weeks and hundreds of miles from their spawning grounds. The Yukon River commercial fishery is essentially a mixed stock fishery and as a result some tributary populations may be under or overharvested in relation to their actual abundance. Based on current knowledge it is impossible to manage stocks separately, and there is concern that small spawning populations may be reduced to very low levels.

Due to the turbid water conditions of the main river (and some of its tributaries) and the vast size of the Yukon River drainage, accurate in-season assessment of the escapement immediately past the intensive downriver fishery is very difficult with the present available technology and funding. Also, in-season management of the runs (often mixed species) is hampered by the variable run timing and pattern of entry into the lower river fishery which causes difficulties when attempting to analyze catch data. The

usefulness of commercial catch data analysis is also limited by recent changes in the commercial fishery. For example, some fishermen use small mesh gillnets (5 1/2 - 6 inch) during the chinook salmon season to harvest the larger run of summer chums in contrast to earlier years when 8-8 1/2 inch mesh gillnets were exclusively used. In addition the fishery has become more efficient (e.g. increased mobility, more fishermen operating drift gillnets, improved communications, increased tendering vessels, improved equipment, etc.). Also the commercial fishery has changed due to regulatory restrictions (delayed season openings, reduced fishing time and maximum mesh size regulations). Greater dependence has been placed on Department test fishing projects in recent years for assessing run timing and abundance.

It has been a policy of the Alaska Department of Fish and Game to maintain current levels of commercial utilization in order to define trends in subsistence utilization and to obtain more information on the relationship between the salmon catch and escapement. Increases in commercial fishing efficiency are expected, which requires that current regulations be maintained or even made more restrictive. Such action is essential to maintain the subsistence priority yet providing for escapements essential to sustained yield of the resource. As a result of the above factors the management of the Yukon River salmon runs must take a conservative approach.

The basic regulations that govern the commercial salmon harvest in the area is emergency order (management order) authority to provide for fishing season openings or closures, fishing periods, mesh size restrictions and/or guideline harvest ranges. Commercial fishing is normally allowed for a total of from one to four days a week during the open season which depends on the district and species involved. Season guideline harvest ranges are utilized for chinook and fall chum salmon fisheries throughout the area. Fishing effort usually occurs during the entire run and not just during any particular segment of the run.

During the fishing season, if it becomes apparent that the run is substantially smaller or larger (based on analysis of comparative commercial and/or test fishing data) than needed for escapement and subsistence

requirements, then the commercial harvest rates can be adjusted through the use of the emergency order or, less frequently, emergency regulation authority. A list of emergency orders dealing with changes in fishing time and other regulations issued for the Yukon Area in 1986 is presented in Attachment 1. Also presented are 1986 regulation changes promulgated by the Board of Fisheries during its April, 1987 meeting (Attachment 2).

Research and management projects have been initiated and other programs are planned, contingent on additional funding, for obtaining the biological information necessary for better management of the salmon runs. During 1986 the following projects were conducted:

1. Test Fishing. Program at Middle and North Mouths (set gillnets for all salmon) in the delta area and fishwheel sites near Ruby (fall chums and cohos) to determine run timing and to provide an index of abundance for comparisons between years.

2. Side Scan Sonar. Projects to enumerate escapements in Anvik River (summer chums) and Sheenjek River (fall chums). In addition, the U.S.F.W.S. operated a project on the Chandalar River (fall chum salmon).

3. Counting Tower. Project to enumerate escapements in East Fork Andreasky River (chinook and summer chum salmon).

4. Main River Sonar. BioSonics hydroacoustic equipment operated in the main Yukon River near Pilot Station to determine the feasibility of enumerating salmon in order to obtain in-season estimates of abundance.

5. Stock Separation Biology. Catch and escapement scale samples of chinook and fall chum salmon were collected throughout the drainage for the purpose of identifying major stocks by scale analysis techniques. This project provides for allocating the catch to areas of origin.

6. Data Processing of Commercial Fishery Statistics. Lower Yukon River commercial catch and effort data analysis from fish tickets, obtained by

microcomputer at the Emmonak field office, was utilized for in-season management purposes.

7. Aerial Surveys of Salmon Spawning Streams. Aerial surveys to maintain index of escapements of primary streams and to develop additional escapement index areas. Additionally, fall chum salmon foot surveys were conducted in the Tanana River drainage.

8. Tagging Project. To estimate harvest rates and total escapement to upper Yukon River (Yukon Territories, Canada) a salmon tagging project was conducted (chinook and fall chum salmon) by D.F.O.

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in the state. The permanent staff assigned (full time) to the Yukon area includes seven positions - two area management biologists, one assistant area management biologist and three research biologists. In addition approximately 30 seasonal employees are hired each season to assist the permanent staff in conducting various management and research studies. Also, the staff aids in the enforcement of regulations in cooperation with the Division of Fish and Wildlife Protection (Department of Public Safety).

Operating funds allocated by the State of Alaska for the Yukon area salmon management and research program from July 1, 1985 through June 30, 1986 were $613,000 and an additional $237,000 was allocated from the Federal Government to address research issues associated with U.S.-Canada salmon negotiations. An additional $22,400 State funds were allocated to conduct herring studies at Cape Romanzof.

In addition to the salmon and herring management and research programs, the staff works to obtain information to determine the potential for commercial fisheries on under-utilized species such as whitefish.

A unique problem in the lower river area is the language/communication barrier. Many of the older native people cannot read or speak English. Therefore, the staff often uses translators when conducting the many public

meetings that are annually held throughout the area. To assist in education and information, special field announcements are broadcast during the fishing season over radio stations KNOM and KICY in Nome and various radio stations in the Fairbanks area.

Special Studies

Attachment 3 lists special studies undertaken during 1986 and includes a summary of objectives, procedures and results for each.

AREA SALMON REPORT, 1986

Area Season Summary, 1986

In 1986 the Yukon River salmon runs were overall judged poor to above average in magnitude, based on comparable catch and escapement data.

In 1986 there were 99,970 chinook, 721,469 summer chum, 139,442 fall chum and 47,255 coho salmon, totaling 1,008,136 salmon taken for commercial sales (Table 4). An additional 272,268 pounds roe was commercially delivered. The U.S. commercial harvest for all species combined was below the previous 1981-1985 average of 1,139,500 and roe production was largest on record (Appendix Table 2-6). Commercial fishing period catch data by district is presented in Tables 6 through 11. Canadian commercial fishermen in the Yukon Territory harvested an additional 10,797 chinook and 11,464 fall chum salmon.

In 1986 the U.S. commercial chinook salmon catch was 28% below the 1981-1985 average of 139,133 fish (Appendix Table 2). The 1986 commercial summer chum salmon catch sold in the round was approximately 9% above the 1981-1985 average of 663,767 fish (Appendix Table 3). Summer chum salmon roe sales were the largest on record and exceeded the 1981-1985 average of 181,547 pounds by 50%. The fall chum salmon commercial catch of fish in the round was the lowest on record since 1968, being 53% below the 1981-1985 average harvest (Appendix Table 4). Fall chum salmon roe sales during 1986 was 87% below the 1981-1985 average harvest of 4,401 lbs.

In 1986 the commercial coho salmon catch was the third largest on record and exceeded the 1981-1985 average of 42,758 fish by approximately 10% (Appendix Table 5).

Subsistence harvests during 1986 in the Yukon Area (excluding Yukon Territory) were estimated at 45,282 chinook and 290,888 summer chum, 164,034 fall chum and 34,470 coho salmon (Table 14). Chinook and summer chum salmon harvests were approximately 20% above the 1981-1985 averages (37,905 and 241,043, respectively). Fall chum (8% below) and coho (6% below) salmon harvests were near 1981-1985 averages (179,129 fall chum and 32,460 coho salmon (Appendix Tables 28-31).

In 1986 a total of 766 Commercial Fisheries Entry Commission (CFEC) gill net permits and 160 fishwheel permits (not including transfers) were issued in the area. Table 5 shows the residency of all persons issued CFEC permits for 1986. Appendix Table 7 shows the number of CFEC permits issued since 1976. The actual number of commercial fishing vessels (fishermen) that made at least one salmon delivery during the season are shown in Appendix Table 8.

The vast majority of the salmon catch was processed primarily as a fresh/frozen product. Production of salmon roe in upper Yukon area fisheries totaled 272,268 pounds from commercial fishermen. Commercial salmon production data is presented in Appendix Table 23. All buyers and processors operating in the Yukon area during 1986 are listed in Table 3.

Yukon area commercial fishermen received $6,248,744 for their catches in 1986. The first wholesale value of the 1986 pack was estimated at $15,621,000 (Appendix Table 24).

Average prices paid to fishermen and average salmon weights are presented in Appendix Tables 25 and 26, respectively.

Commercial Fishery, 1986

Lower Yukon Area

The 1986 lower Yukon area (Districts 1, 2 and 3) commercial salmon catch totaled 926,427 fish which was comprised of 95,785 chinook, 669,996 summer chum, 113,452 fall chum, and 46,814 coho salmon (Appendix Tables 2 - 5 and 13).

Fishing effort, in terms of the actual number of participating fishermen (gear permit holders), is presented in Appendix Table 8. In 1986 a total of 706 CFEC gillnet permits were issued for the lower Yukon area (Appendix Table 7). A total of 672 permit holders fished at least once in the lower three districts during 1986.

A total of 8 processors operated in the lower Yukon Area in 1986. Five processors bought fish in more than one district. Nearly all of the commercial salmon catch was shipped to fresh or fresh- frozen markets. One processor in District 1 hard-salted 22,900 lbs. of salmon. For the second time in the history of the fishery there was no canning of salmon in the Yukon area.

Chinook Salmon: The timing of the chinook salmon migration in the lower Yukon was late as anticipated by the cold temperatures and late breakup of river ice. The mean April Nome air temperature was 12^{0} F. (5^{0} lower than normal) (Appendix Table 38). The lower river was generally free of ice by 1 June. The first chinook salmon was reported caught on 6 June at Alakanuk by a subsistence fisherman.

Significant test fishing and subsistence catches occurred 16 June and increased sharply in the south mouth prior to the chinook directed commercial fishery. The commercial fishery was opened by emergency order after subsistence and test fishing catches indicated that 7-10 days of the chinook salmon run had passed through the lower river. In accordance with the Yukon Area Salmon Management Plan the fishing season in each district was opened on

a staggered basis: 19 June in District 1, 22 June in District 2, and 26 June in District 3. These were the second latest opening dates in the history of the fishery. A conservative management plan was required in consideration of an anticipated chinook salmon return of average magnitude. This preseason projection was based on the assessment of 5 - year old returns from the 1980 parent year in 1985, and new information which indicated excessive exploitation rates had occurred in 3 out of the last 4 seasons. Initially chinook salmon directed fishing periods (unrestricted mesh size) of 24 hours duration were established in the lower river with 72 hours between periods to allow for a segment of the run to pass through each district without being fished (Tables 6 and 7). The schedule was maintained through two fishing periods each in Districts 1 and 2. This was different than prior seasons (since 1977) when twice weekly 24 hour periods were scheduled (District 1 - Mondays and Thursday, District 2 - Sundays and Wednesdays).

On 25 June it was estimated that by the end of the second District 2 chinook salmon directed period, the combined District 1 and 2 harvest would approach 65,000 to 75,000 chinook salmon while the middle portion of the run was yet in progress. The chinook salmon run at this time, based on test and commercial catch information, appeared to be of average or slightly better than average magnitude which indicated an appropriate chinook salmon harvest for Districts 1 and 2 would be between 90,000 and 110,000 fish, slightly in excess of the midpoint of the guideline harvest range. This harvest goal was to include the incidental catch of chinook salmon during restricted mesh size openings. The incidental catch during restricted mesh size openings had averaged 19,700 during 1981-1985.

Departure from the established fishing schedule was necessary following the second District 2 period to ensure adequate escapement from the middle portion of the run, and to further spread the harvest out over the entire run. Therefore, the third unrestricted mesh size chinook salmon directed fishing periods were delayed until 29 June and 1 July in Districts 1 and 2, respectively. At this time the traditional twice weekly schedule was initiated.

In summary, a total of 94,832 chinook salmon was taken in Districts 1 and 2 between 14 June and 15 July. During eight unrestricted mesh size periods (four each in Districts 1 and 2) between 19 June and 7 July, 79,525 chinook salmon were taken, and during restricted mesh size periods (six inch maximum mesh size) 15,307 chinook salmon were taken of which only 2,498 fish were taken after the chinook directed season. In District 3, which is managed under a 1,800 to 2,200 guideline harvest range, a total of 901 chinook salmon was taken during three unrestricted mesh size periods (Table 8). The total lower Yukon area chinook salmon harvest was 95,733 fish, well below the 1981 - 1985 average of 132,732 fish.

Commercial catch per unit effort data for District 1 is presented in Appendix Tables 8 and 9.

The majority of the chinook salmon run entered the south and middle mouth passes. Most of the District 1 catch was taken in these two mouths and the Head of Passes-Ten Mile area.

The age composition of the chinook salmon commercial catch in the lower Yukon area was 1.4% 4-year-old, 31.6% 5-year-old, 43.3% 6- year-old, and 23.6% 7-year-old fish. The average weight of chinook salmon in the commercial catch was 20.2 pounds.

Summer Chum Salmon: The summer chum salmon migration exhibited average run timing. The first lower river test net catches were on 7 June, and catches increased rapidly indicating an exceptionally strong summer chum salmon run. The summer chum salmon migration developed rapidly in comparison to the chinook salmon migration. The commercial fishing season opened with special chum salmon directed fishing periods with restricted mesh size gillnets (six inch maximum mesh size) due to the abundance of summer chum salmon prior to significant development of the chinook salmon run. A total of 352,772 summer chum salmon was harvested before the end of the chinook salmon directed fishing season. This harvest occurred during three restricted mesh size fishing periods in District 1 (14 June to 2 July) of 12-hour duration each and four restricted mesh size fishing periods in District 2 (15 June to 4

July) of six or twelve hour duration. During the eight unrestricted mesh size periods directed for chinook salmon in Districts 1 and 2 of 24-hour duration each, a total of 231,372 summer chum salmon was harvested. Following the chinook salmon directed season there were three restricted mesh size periods of 24-hour duration each in District 1 (7 July - 15 July), and two restricted mesh size periods of 24-hour duration each in District 2 (9 July - 14 July) for an additional summer chum salmon harvest of 85,410 fish. In District 3 a total of 442 summer chum salmon was commercially harvested during three-24- hour unrestricted mesh size fishing periods. The total lower Yukon area summer chum salmon commercial harvest was 669,996 fish, slightly in excess of the 1981 - 1985 average harvest of 606,276 fish.

Special chum salmon directed fishing periods, prior to the end of the unrestricted mesh size season, were introduced in 1985, as endorsed by the Board of Fisheries in November of 1984. A single six-hour period was allowed in District 2 during 1985. This management strategy was implemented to utilize surplus summer chum salmon. The increased number of special chum salmon directed fishing periods in 1986 was in response to late run timing of chinook salmon in comparison to the summer chum salmon migration and the exceptional strength of the summer chum salmon run. These special periods will not occur as frequently during years of average summer chum salmon run strength.

Problems were encountered by processors due to increased availability of summer chum salmon in District 1. It was estimated that about 12,000 - 15,000 summer chum salmon were wasted due to lack of processing capacity (not included in harvest figures). Additionally, lower river fishermen voiced their concern and displeasure regarding the harvest of summer chum salmon prior to achieving the chinook salmon harvest guideline. Commercial summer chum salmon catch and effort data is presented in Appendix Tables 3 and 19.

The summer chum salmon commercial catch in the lower Yukon area was composed of 27% 4-year-old and 72% 5-year-old fish. The average weight of summer chum salmon in the lower Yukon Area was 6.9 pounds.

Fall Chum Salmon: In the lower Yukon area the percentage of fall chum salmon in the test net catches increased steadily after 13 July, and by 18 July essentially all chum salmon captured were fall chum salmon. The fishing season was closed effective 15 July in Districts 1-3 to afford protection for the early segment of the return and to provide the Department the opportunity to determine if run strength was great enough to provide for a commercial harvest.

By 21 July it was apparent that the fall chum salmon run was early and that the early portion of the run was unexpectedly strong. As indicated by test net catches and main river sonar counts, relatively large numbers of fish entered the river 18-20 July and 24-26 July. By 25 July it was judged run strength was sufficient to allow a limited commercial harvest. A flexible guideline harvest range of 0-110,000 fall chum salmon was in effect for Districts 1,2 and 3 combined.

The commercial fishing season was re-opened effective 4 August in District 1, 6 August in District 2, and 10 August in District 3. Fishing periods were established by emergency order on a period- by-period basis to provide management flexibility in adjusting harvest to run strength. After re-opening the fishing season both test fishing and main river sonar data indicated average to above average run strength. A total of 6 fishing periods each was allowed in Districts 1 and 2, and 5 fishing periods were established in District 3. Fishing periods were of 6 to 12-hour duration (except in the Set-Net-Only area of District 1 which had twice the amount of fishing time).

The total fall chum salmon harvest was 113,452 fish for the lower Yukon Area (59,352 in District 1, 51,307 in District 2, and 2,793 in District 3). The lower Yukon area fall chum salmon harvest was 48% below the recent 5-year average (218,651 fish).

Commercial fall chum catch and effort data are presented in Appendix Tables 4 and 20.

In 1983 the Board of Fisheries adopted regulations establishing a "Set Net Only Area" in the lower portion of the delta area of District 1 for the fall chum salmon fishery (after 19 July). This special "area" was created to provide additional fishing time for setnet fishermen whose fishing effectiveness is influenced by the tides. Fishermen must register for this area, operate only set gill nets, and once registered cannot fish elsewhere in the remainder of District 1 ("Gill Net Area") or in Districts 2 or 3. Overall, fishermen in the "Set Net Only" area did as well as their counterparts in the gillnet area. The fall chum and coho salmon catch for the "Set Net Only" and "Gill Net" areas of District 1 is presented in Appendix Table 22.

The lower Yukon area commercial fall chum salmon catch was composed of predominantly 4-year-old (73%) and 5-year-old (20%) fish. Average weight of fall chum salmon was 7.2 pounds in the lower Yukon area.

Coho Salmon: Department test net catches indicated a marked increase in coho salmon abundance on 11 August after which significant numbers of coho salmon were taken. The lower Yukon area coho salmon catch of 46,814 was the second largest in history. The coho salmon catch by district was as follows: District 1 (24,824), District 2 (21,197), and District 3 (793).

Commercial coho salmon catch and effort data for District 1 is shown in Appendix Table 20.

The lower Yukon area commercial catch of coho salmon was composed of 3-year-old (2.2%), 4-year-old (88.6%), and 5-year-old (9.2%). The average weight of coho salmon in the commercial catch was 6.3 pounds in the lower Yukon area.

Upper Yukon Area

During the 1986 season the combined upper Yukon commercial salmon harvest totaled 4,185 chinook, 51,475 summer chum, 25,990 fall chum and 441 coho salmon (Appendix Table 2-5). An additional 272,268 pounds roe was

commercially delivered. Salmon production data is expressed as number of fish sold in the round and pounds of unprocessed roe which were sold. On average, female chum salmon from the middle and upriver districts produce approximately one pound of roe per individual. Table 6 presents total estimated commercial related salmon catch by district during 1986. These catch figures reflect the incidental catch of male summer chum salmon taken incidental to the roe directed fishery in the upper Yukon area which were not sold.

Upper Yukon commercial fishermen received an estimated (per round weight pound) average of $0.89 for chinook salmon, $0.22 for summer chum salmon, $0.14 for fall chum salmon, $0.21 for coho salmon, and $2.08 for salmon roe (Appendix Table 25). The approximate (ex-vessel) value of the 1986 harvest was $725,948 fish which includes an estimated $552,726 (76%) paid to fishermen for salmon roe sales. During the course of the season, 162 upper Yukon fishermen participated in the commercial fishery, (making at least one delivery) and average per-fisherman earnings were approximately $4,500.

A total of 9 buyer/processors and 9 catcher-sellers reported deliveries during 1986.

Chinook Salmon: The first reported chinook salmon taken in District 4 was on 8 June in Galena. Significant catches did not begin in this district until the end of June. Only 11 chinook salmon were harvested in Subdistrict 4-A with 491 chinook salmon taken in Districts 4-B and 4-C (Table 12). A large proportion of the chinook salmon harvest in this district is thought to be retained for personal use, rather than sold in the commercial market.

Run strength in the lower portion of District 5, as indicated by subsistence and commercial catch rates indicated a run (predominantly Yukon Territory stocks) of above average magnitude. Run timing appeared to be normal and the first deliveries were made during the 48-hour period ending on 29 June. The season in Subdistricts 5-A, 5-B, and 5-C was closed by emergency order on 12 July with a harvest of 2,427 fish. In Subdistrict 5-D, 306 chinook salmon were taken and the season was closed by emergency order on 19 July. Even

though catch rates indicated a stronger-than-average run, emergency closures were imposed when catches were at or near the lower end of the guideline harvest ranges in order to improve upriver escapements.

A reported total of 950 chinook salmon was harvested commercially from District 6 (Tanana River). The commercial season was closed on 17 July with the harvest estimated at 750 chinook salmon. The commercial season was re-opened 25 July to 13 August in response to above average summer chum salmon run strength. A total of 74 chinook salmon was taken during these twice weekly 48 hour periods. Late-arriving fish tickets from the 15 June to 17 July season accounted for the difference in estimated and final catch estimates. Although escapements were judged to be above average prior to closure of the commercial season, the season was closed to maintain the harvest within the guideline range and to prevent a defacto reallocation of chinook salmon from the lower Yukon area to the upper Yukon area districts.

Summer Chum Salmon: The 1986 harvest of summer chum salmon taken during open commercial fishing periods in the upper Yukon area was estimated at 518,854 (Table 13). Fishery sales receipts (fish tickets) accounted for the sale of 51,473 fish in the round and 271,691 pounds of roe. These harvests of fish in the round and pounds roe sold were 10% below and 50% above the recent 1981- 1985 averages, respectively (Appendix Table 6).

Since 1980, buyers and processors operating in District 4 have had very limited markets for summer run chum salmon; as a result, salmon roe has become the primary fisheries product exported from the area. During 1986, an approximate total of 270,000 pounds of summer chum salmon roe was produced in District 4, roughly 88% of which originated in Subdistrict 4-A. Only 300 summer chums (in the round) were sold in this district. Although established regulations require utilization of carcasses, and many are utilized to meet subsistence requirements, significant waste was documented during the 1986 season.

A total of 75 commercial fishermen made landings in District 4 during the 1986 summer season which is slightly in excess of the 1981-85 average (72) (Table 9 and Appendix Table 8).

In District 5, summer chum salmon are sold only incidentally to the directed chinook salmon harvest; a total of 690 summer chum salmon in the round was commercially harvested during the 1986 season.

The District 6 summer chum salmon harvest was composed of 50,483 fish in the round and 2,146 pounds roe. The harvest of summer chum salmon in the round was 25% above the 1981-1985 average. The roe harvest was the highest on record and 99% above the 1981-1985 average. The carcasses of female and the males taken incidental to the roe directed fishery are thought to be fully utilized to meet subsistence needs. This fishery is located on the road system and buyers in this area do not have the high freight costs associated with shipping fish from more remote locations such as Galena or Grayling. Primarily for this reason, a higher percentage of Tanana River summer chum salmon are marketed in the round than in District 4.

The first deliveries of summer chum salmon in District 6 occurred 7-9 July and by 15 July it was evident that an exceptional run was in progress. Due to achievement of the chinook salmon harvest guideline, the season closed 17 July. After chinook salmon abundance declined the season reopened 25 July and closed 13 August. Approximately 88% of the summer chum salmon harvest was taken during the second season.

Fall Chum and Coho Salmon: During the 1986 season a total of 25,990 fall chum salmon and 577 pounds of fall chum salmon roe was sold in Districts 4, 5, and 6 (Table 13). Roe sales occurred in Districts 5 and 6.

Prior to the arrival of fall chum salmon into Subdistricts 4-B and 4-C the commercial fishery was closed to afford protection for the early portion of the fall chum run while providing an opportunity to determine if run strength was sufficient to provide for a commercial harvest. By 10 August catch rates at the north bank test fishwheel located 14 miles above Ruby verified lower

river estimates of average or above average run strength and the commercial season was re-opened on 13 August. Poor market conditions limited fishing effort and catches, however, a few catcher-sellers operated. The season closed 5 September with a fall chum salmon harvest of 2,045 fish. No coho salmon landings were reported.

District 5 closed following the summer season on 19 July and re- opened 19 August after a portion of the fall chum salmon run had passed through the district, and fall chum salmon were well distributed throughout the district. Three 24-hour periods and a single 36-hour period took place prior to the 31 August season closure. A total of 22,053 fall chum salmon and 395 lbs. of roe was harvested. No coho salmon landings were reported.

Inseason fall chum salmon run strength into the Tanana River drainage (District 6) is initially identified by a test fishwheel located approximately 20 miles upstream of Ruby on the south bank of the Yukon River. Test fishwheel catches indicated the District 6 fall chum salmon run would be as strong as the mainstem Yukon River run. Based on Ruby test fishwheel catches and reports of several Tanana River subsistence fishermen, a 12- hour commercial fishing period was established by emergency order on 12 September. A total of 1,892 fall chum salmon, 441 coho salmon and 182 pounds roe were harvested. This poor catch was the first indication of a poor fall chum salmon return to the Tanana River. The subsistence harvest was closely monitored over the next several days and catches continued to be poor, confirming that the Tanana River fall chum salmon run was weak. No further commercial fishing was allowed in the Tanana River. Due to the apparent poor run and the need to improve escapements to Kantishna River tributaries, which had poor escapements from 1982 to 1984, the Kantishna River was closed to subsistence fishing on 19 September. This closure affected four fishing families that live within the Kantishna drainage.

Subsistence Fishery, 1986

Subsistence salmon catch data have been collected through the use of personal interviews and/or catch calendars (on which fishermen record daily catches)

since 1961. Additionally, in recent years subsistence fishing permit catch information has been available for three sections of the upper Yukon area. Due to funding limitations the Department was unable to send survey crews to all villages in 1983 and 1984 to interview fishermen, however, in 1985 personal interviews were conducted in most villages. During 1986, in response to funding provided for US/Canada negotiation support, the most comprehensive subsistence fishery harvest survey on record took place. In the lower Yukon Area during 1986, interviews with fishermen were conducted in all villages (11), while in the upper Yukon Area interviews were conducted in the majority of communities along the mainstem Yukon River (16) and communities along significant tributaries of the Yukon River (9). Additionally, subsistence harvest information was collected by the Department of Fisheries and Oceans (DFO)in Canada.

While conducting personal interviews the subsistence survey participation list was updated and participants not home during the interviews were mailed questionnaires. The catch by fishermen, who were known to have fished for subsistence purposes but who were not interviewed and did not return the questionnaire, was derived by averaging the total known catch (by species) for that village and assigning those values to households not contacted. Information regarding numbers of dogs and type and amount of fishing gear was determined in a similar manner.

Potential problems with expansion of data in the manner described above should be explained. In some cases, a single fisherman may take several thousand chums for purposes of feeding large numbers of sled dogs. When data for a village which include atypical catches like these, the final expanded value may exceed what could reasonably be expected to have been caught. Conversely, expanded data which does not include a fisherman who made extremely large catches, may understate the actual harvest for that village.

Table 14 presents 1986 catch estimates by village and Appendix Tables 27-31 show long-term comparative catch data.

The estimated total chinook salmon subsistence harvest for the entire Yukon River drainage of 54,549 fish is the second highest on record and was exceeded only in 1980 (Table 14). The estimated (combined) chum and coho salmon harvest of 492,764 fish was the second largest recorded since 1940 and is 7% above the recent five-year average and 21% above the recent ten-year average.

Lower Yukon Area

During 1986, an estimated 16,010 chinook, 85,878 summer chum; 24,268 fall chum and 12,646 coho salmon were harvested by fishermen representing 505 households for subsistence purposed in the lower Yukon Area (Table 14). Catches of chinook and summer chum salmon were 25% and 78% above the recent five year average, respectively. Fall chum and coho salmon catches were similar to the recent five year average. The historical subsistence catch and effort data indicate a fairly stable trend in fall chum salmon catches, while catches of the other species appear to be increasing over the past seven years. Fall chum and coho salmon catches were probably slightly higher than reported because some fishing occurred after the interviews were completed.

In all villages, most of the chinook and summer chum salmon were caught prior to the opening of commercial fishing. Fall chum salmon were caught prior to and after the commercial fishing season.

Upper Yukon Area

The 1986 upper Yukon area (excluding Canada) subsistence salmon catch was estimated to be 395,872 fish. Of these were an estimated 29,272 chinook, 205,010 summer chum, 139,766 fall chum, and 21,824 coho salmon. Catches of chinook, summer chum and coho salmon were 17, 6, and 10% above the recent 5 year average, respectively. Fall chum salmon catches were 10% below the recent 5 year average.

The possibility of overestimating the summer chum salmon subsistence harvest in District 4 has been discussed in previous annual management reports. As was discussed in a previous section of this report, commercial fishermen in District 4 have only a very limited market for summer chum salmon. As a result, fishermen extract and sell roe from their catch and retain the carcasses for personal use. During the 1980-1985 period, it is likely that many fishermen have reported this portion of their commercial harvest as subsistence fish. In fact, it is probable that the unmarketable commercial product have simply replaced a large portion of the subsistence harvest in this area. During 1985, Division of Subsistence personnel conducted the subsistence catch surveys in Kaltag and Nulato. Questions regarding summer chum harvest were posed in such a way as to eliminate reporting of "surplus" commercially caught fish as subsistence. For this reason, summer chum catches from these villages during 1985 was much lower than in previous years or the current year. The 1986 subsistence survey, personal interviews, were conducted in such a manner to estimate the number of summer chum salmon taken by commercial related activities and those taken by standard subsistence fishing means. An estimated total of 139,342 summer chum salmon were taken for subsistence utilization within the District 4 watershed, with 76% being taken in association with commercial fishing related activities.

Subsistence fishing permits are required in three areas within the upper Yukon drainage: (1) the Tanana River drainage upstream of the Wood River confluence; (2) the Yukon River between Hess Creek and Dall River; and (3) the Yukon River between the upstream mouth of Twenty-two Mile Slough and the U.S./Canada border (Table 14 and Appendix Table 32).

Escapement, 1986

Comprehensive salmon escapement enumeration studies were conducted in 1986 on the East Fork Andreafsky, Anvik, Chena, Chandalar, Sheenjek, and Delta Rivers in the Alaska portion of the Yukon River drainage and on the Fishing Branch River, Big Salmon River, and at the Whitehorse fishway in Yukon Territory, Canada. Studies at each of these locations were designed to enumerate or estimate more completely the total population of spawners by a variety of

methods. A counting tower was operated on the East Fork Andreafsky River while hydroacoustic techniques were employed on the Anvik, Sheenjek, and Chandalar Rivers. Escapement in the latter river was monitored by the U.S. Fish and Wildlife Service. A population estimate was made for chinook salmon in the Chena River using tag and recapture methods. A fall chum salmon population estimate for the Delta River was made using replicate ground surveys together with stream life data. The Canadian Department of Fisheries and Oceans operated a weir on the Fishing Branch and Big Salmon rivers while an enumeration window and passage gate was operated at the Whitehorse fishway. Remaining escapement enumeration throughout the Yukon River drainage was obtained primarily by aerial surveys and occasional ground surveys. Results obtained in 1986 are shown in Table 16 while Figures 2 through 6 show major Yukon River tributary systems.

Appendix Table 33 presents historic chinook salmon escapement data for selected streams during the 1972-1986 period. Climatological conditions were generally favorable for conducting aerial escapement surveys to most primary index streams for chinook and summer chum salmon in the lower portion of the Yukon River drainage in 1986. Heavy rains and high water during the latter part of July hindered surveys in the middle portion of the drainage, particularly in the Tanana River system. The worst survey conditions were encountered in the Yukon Territory where only three major index streams were successfully surveyed by ADF&G during the month of August (peak chinook salmon spawning period).

Chinook salmon escapements in the Alaskan portion of the Yukon River drainage were good in 1986. Minimum and optimum chinook salmon escapement goals have been established for five streams in the Alaskan portion of the drainage: East (1,100-1,600) and West Fork (700-1,000) Andreafsky, Anvik (300-500), Chena (1,000- 1,700), and Salcha (1,500-3,500) Rivers (Table 17). These escapement goals are based upon aerial survey counts which do not represent total escapement, but do reflect annual spawner abundance trends when using standard survey methods under acceptable survey conditions. The optimum goal was achieved in all but the Salcha River where the escapement was only 132 fish below the optimum goal for that stream. In addition, chinook salmon

escapements in the North and South Fork Nulato River were nearly triple the single escapement objective set for those streams (500 for each stream). Chinook salmon escapement in the Gisasa River was more than twice the escapement goal set of that stream (650). Further indications of good chinook salmon escapements to the Koyukuk River drainage are reflected in aerial counts made in Henshaw Creek (561) and the mainstem South Fork Koyukuk River (556).

Based upon limited survey success in that portion of the drainage which lies in Yukon Territory, Canada, chinook salmon escapements appear to have been similar to those observed in 1985. Counts in 1986 were 745 and 716 chinook salmon in index areas of the Big Salmon and Nisutlin Rivers, respectively. The Whitehorse fishway count was 557 chinook salmon, which includes 150 removed for hatchery brood stock. A population estimate of chinook salmon entering the Canadian portion of the drainage made by the Department of Fisheries and Oceans was 36,479 in 1986. Their tag and recapture population estimate for Canadian-bound chinook in 1985 was 29,881. Canadian fishery catches removed from the tagging estimates resulted in escapement estimates of 17,500 chinook salmon in 1986 and 10,800 chinook salmon in 1985.

Comparative summer and fall chum escapements since the mid-1970's for selected spawning streams are shown in Appendix Tables 34 and 35.

Minimum and maximum summer chum salmon escapement goals have been established for six major spawning streams in the lower Yukon River drainage: East (76,000-109,000) and West Fork (62,000- 116,000) Andreafsky, Anvik (209,000-356,000), and North Fork (37,000-53,000) Nulato Rivers. Escapement goal ranges are 5,000- 8,000 summer chum salmon in Clear Creek and 5,000-9,000 in Caribou Creek of the Hogatza River drainage. These latter two streams were not surveyed in 1986 due to poor survey conditions during dates of peak spawning. However, the optimum escapement goal was met in both the Anvik and West Fork Andreafsky Rivers while the minimum goal was achieved in the East Fork Andreafsky and North Fork Nulato Rivers. Based upon these data, summer chum salmon escapements to the lower Yukon River were good.

Summer chum salmon escapement to the Tanana River drainage was also good based upon escapement observations made in the Salcha River. An estimate of 8,028 summer chum was made for this stream, being more than double the escapement goal of 3,500.

Fall chum salmon escapement objectives were redefined for three major Alaskan spawning streams on a post-season basis in 1986 using all available data subsequent to 1973: Sheenjek River (62,000), Delta river (11,000), and upper Toklat River (33,000). These new objectives were used to measure the success of 1986 spawning escapements.

Fall chum salmon escapements were better than expected in 1986, particularly in the Porcupine River drainage and Kluane River. Escapements in the Porcupine River are reflected by observations made for the Sheenjek and Fishing Branch Rivers. A sonar- estimated escapement of 83,197 chums in the Sheenjek River exceeded the new escapement goal established in 1986 of 62,000. The DFO weir count on the Fishing Branch River of 31,173 chum salmon was markedly improved from the poor escapements observed during the period 1982-1984. A population estimate of fall chum salmon entering the Canadian portion of the mainstem Yukon River made by D.F.O. was 100,629 fish in 1986. Their tag and recapture population estimate for the same area in 1985 was 100,265. Canadian fishery catches removed from tagging estimates resulted in escapement estimates of 87,990 in 1986 and 59,000 fall chum in 1985. Fall chum salmon escapement to the Kluane River (16,686) was the second largest ever recorded in that river. By contrast, an extremely low escapement of fall chums was observed to the mainstem Yukon River in the spawning areas between Fort Selkirk and Carmacks. Only 825 fall chums were observed.

Comprehensive enumeration of fall chum salmon on the Chandalar River was undertaken for the first time in 1986. The sonar- estimated escapement by USFWS was 59,313.

In the Tanana River drainage, fall chum salmon escapements were low. A total of 12,708 chum salmon were observed in the Toklat River with an expanded season escapement of 18,903. This was significantly lower than the

escapement objective of 33,000. Likewise, a population estimate of Delta River spawning fall chum salmon (6,703) was lower than the escapement goal of 11,000.

While coho salmon escapements appeared near average or slightly below average to spawning areas in the Nenana River drainage, escapements to the upper Tanana River area (vicinity of Big Delta) were above average (Appendix Table 37).

Enforcement, 1986

Lower Yukon Area

During the fishing season Fish and Wildlife Protection officers made several boat patrols and periodic float plane patrols in the lower Yukon area. More effective enforcement is needed in view of reported violations (e.g. fishing without permits, fishing large mesh gill nets after 6 inch maximum mesh size regulation become effective, and fishing closed water areas). It is recommended that two man FWP crews be stationed at St. Marys and Emmonak to conduct regular boat patrols throughout the fishing season and to provide wider coverage.

Upper Yukon Area

In most portions of the upper Yukon districts, compliance with commercial and subsistence fishing regulations was good. Violations of regulations dealing with the sale of subsistence- caught salmon and roe from those salmon, however, occur with regularity in certain areas. Enforcement of these regulations is difficult and has been largely ineffective to date. In addition, wastage of commercially caught salmon in those areas where markets exist only for salmon roe may be more common than was initially thought.

OUTLOOK FOR 1987

Chinook Salmon

In most years, the dominant age class returning is 6 year-old- fish; however, 5-and-7 year old fish also contribute to the run. The 1981 brood year run (6-year-olds in 1987) was judged above average in abundance as indicated by comparative catch and escapement data. The return of 5-year-olds in 1986 was above average suggesting a strong return of 6-year olds in 1987. The return of 5-year-olds (1982 brood year) in 1987 is expected to be below average, based on below average escapements in 1981. Seven-year-olds are not expected to contribute significantly to the run in 1987, based on the below average return of 6-year-olds in 1986. In summary, based on evaluation of brood year escapement data, it is expected that the 1987 Yukon River chinook salmon run will be above average in magnitude, with the run being supported primarily by six-year old fish. The commercial Yukon area chinook salmon catch in Alaska is expected to total 97,000 to 127,000 chinook salmon.

Summer Chum Salmon

Normally, Yukon River summer chum salmon runs are predominately composed of 4-year-old fish, although in some years 5-year-old fish are present in large numbers. The return of 4-year-olds in 1987 will be dependent on the strength of the 1983 brood year and the survival of the resulting offspring. Based on the available catch and escapement data, the magnitude of the 1983 summer chum salmon run was judged below average to average in abundance. The return of 4-year-olds in 1987 is expected to be of similar magnitude. The return of 5-year-olds is expected to be average based on the average return of 4-year-olds in 1986. In summary, based on evaluation of brood year run size data and assuming average survival, the magnitude of the Yukon River summer chum salmon run in 1987 is expected to be average. The commercial harvest is expected to total 600,000 - 900,000 fish.

Fall Chum Salmon

Similar to the summer run, the majority of the fall chum salmon returning each year are 4-year-old fish. The magnitude of the 1983 escapement was poor, being near the lowest ever recorded. The return in 1987 is expected to be of similar magnitude. The return of 5-year-olds (1982 brood year) may not significantly contribute to the run based on the apparent below average return of 4-year-olds in 1986 resulting from record low escapements in 1982. In summary, based on evaluation of brood year escapements and assuming average survival, a very poor return is expected in 1987. If the actual return is weak, no or very limited commercial fishing for fall chums can be expected in order to achieve minimum escapement objectives.

Coho Salmon

Four-year-old fish (1983 brood year) are the dominant age class. Adequate escapement information for coho salmon is lacking, but escapement surveys in the Tanana River system indicated above average run strength in 1983. The harvest in 1987 is expected to be dependent on the amount of fishing effort directed toward the fall chum salmon run.

CAPE ROMANZOF DISTRICT HERRING FISHERY

Commercial Fishery, 1986

Commercial Pacific herring fishing periods have been established by emergency order since 1982. Three commercial fishing periods were allowed during 29 - 31 May 1986 for a total fishing time of 42 hours (Table 18). A record harvest of 1,865 short tons (st) was made during the shortest ever fishing season. The peak catch day was 31 May when 1,047 st were taken by 94 fishermen. The entire harvest was taken from Kokechik Bay (Figure 21).

Ninety-eight percent (1,819 st) of the harvest was sold for sac roe. Average sac roe recovery was 9.2%. Wastage of Pacific herring was not a problem.

Estimated value of the total harvest to the fishermen was approximately $1.1 million. Average price was $660 per st for 10% roe recovery with an increase or decrease of $66 per st for each percentage point above or below 10%. Five processors purchased herring in the Cape Romanzof District, three more than 1985 (Appendix Table 40). A total of 97 fishermen participated in the fishery, a 33% increase in fishermen over 1985. Local fishermen (primarily from Hooper Bay, Chevak, and Scammon Bay) accounted for 84% of the effort and 70% of the total harvest.

The overall exploitation rate of Pacific herring was estimated to be 24.9% of the available biomass. Age 8 and 9 Pacific herring comprised approximately 68% of the total harvest. Age 4 Pacific herring were not observed in the commercial catch.

Record catch rates, ideal fishing conditions, and fishing after period closure resulted in a harvest exceeding the maximum 20% guideline exploitation rate. Catch efficiency was significantly increased by non-local fishing vessels using power rollers and shakers. The high catch efficiency and limited tender support slowed catch delivery time. Most vessels were filled to capacity and experienced a long wait prior to unloading. This resulted in over 40 gill nets remaining in the water after the end of the third fishing period. Many fishermen made conscientious efforts to bunch or tie off their nets to prevent further fishing.

No Fish and Wildlife Protection vessel or personnel were present on the Cape Romanzof fishing grounds during the 1986 Pacific herring commercial fishing season. ADF&G staff conducted fishery patrols with efforts directed toward interviewing fishermen regarding fishery participation.

Subsistence Fishery, 1986

In 1986, a subsistence harvest of 7.0 st of herring was reported taken by fishing families from Hooper Bay, Chevak and Scammon Bay. The above catch represents minimal figures since not all families were contacted. Comparative subsistence catch and effort data is presented in Appendix Table 41.

Herring Abundance

A total of 2 aerial surveys was flown on 2 days during the 1986 season from 26 - 29 May. All surveys were conducted under poor to unsatisfactory conditions.

Test fishing was conducted during 26 May - 10 June. A total of 560 Pacific herring was sampled from these catches. Pacific herring comprised over 98% of the total catch of schooling fishes. The commercial catch was sampled from 29 to 31 May. A total of 620 Pacific herring was sampled from this harvest.

Aerial survey biomass techniques were not successful due to the usual turbid water conditions. The Pacific herring biomass was estimated to be approximately 7,500 st based on test fishing study results, commercial harvest rates, and spawn deposition study findings. Age 7 and older Pacific herring comprised 70% of the sampled population. Age 4 Pacific herring comprised 5 % of the population. Ground surveys indicated primary spawn deposition occurred from 28 May - 4 June. In general, spawn deposition extent and intensity appeared comparable to that documented during 1983 - 1985.

Outlook

Emergency order authority will be used to adjust the occurrence and length of fishing periods. A minimum level of biomass cannot be used to determine the timing and duration of commercial fishing periods since turbid water conditions usually preclude aerial biomass assessments. Therefore, test and commercial catch rates and spawn deposition observations will be used to determine timing and duration of commercial fishing periods. Average harvest for the period 1980 - 1986 was 1,022 st. Projected return for 1987, based upon limited data, is 4,500 st which at a 20% exploitation rate would result in a 900 st harvest.

COMMERCIAL FRESHWATER FISHERIES

Regulations adopted by the Board of Fisheries allow the Department of Fish and Game to issue permits for the commercial harvest of miscellaneous species of fish such as whitefish, sheefish, char, trout pike, blackfish and lamprey. Permit authorization is not required for the sale of these species when taken incidentally in conjunction with commercial salmon fishing.

Commercial fisheries for species other than salmon have been allowed in widely scattered locations throughout the Yukon and Tanana River drainages and in the Colville River on the North Slope; most of these fisheries are limited, experimental-type operations and occur only sporadically.

A commercial fishery for whitefish has existed in the Colville River delta (located approximately 60 miles west of Prudhoe Bay) since 1964. Fishing generally takes place during late June and July for broad and humpback whitefish, and October through early December for arctic and least cisco. Set gillnets (of 3-and 5- inch stretch measure) are used as capture gear, and fishing during fall months occurs under the ice (Appendix Table 42).

In the upper Yukon area set net fisheries targeting on whitefish have been permitted in recent years in Lake Minchumina and Healy Lake. Catch data are presented in Appendix Table 43.

Numerous other permits allowing limited harvests of whitefish, primarily for the upper Yukon area, have been issued; for reasons unknown, these fisheries did not occur.

Permits for the taking of non-salmon species have been issued for various locations in the lower Yukon area. Reported harvests for those fisheries are presented in Appendix Table 44. Set gillnets are primarily used for taking whitefish and sheefish and the catch is marketed in local village stores or Bethel.

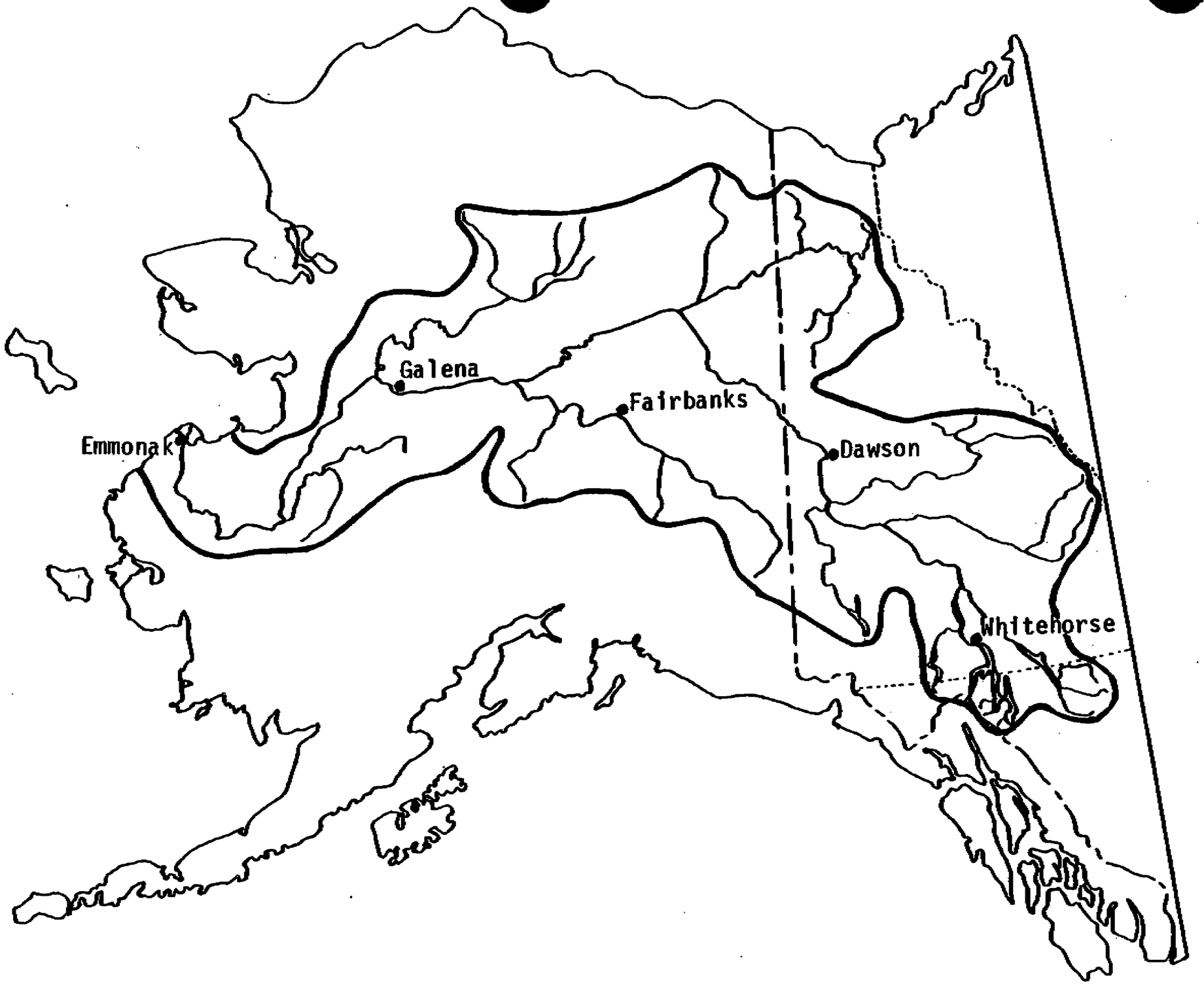


Figure 1. The Yukon River drainage, 330,000 square miles.

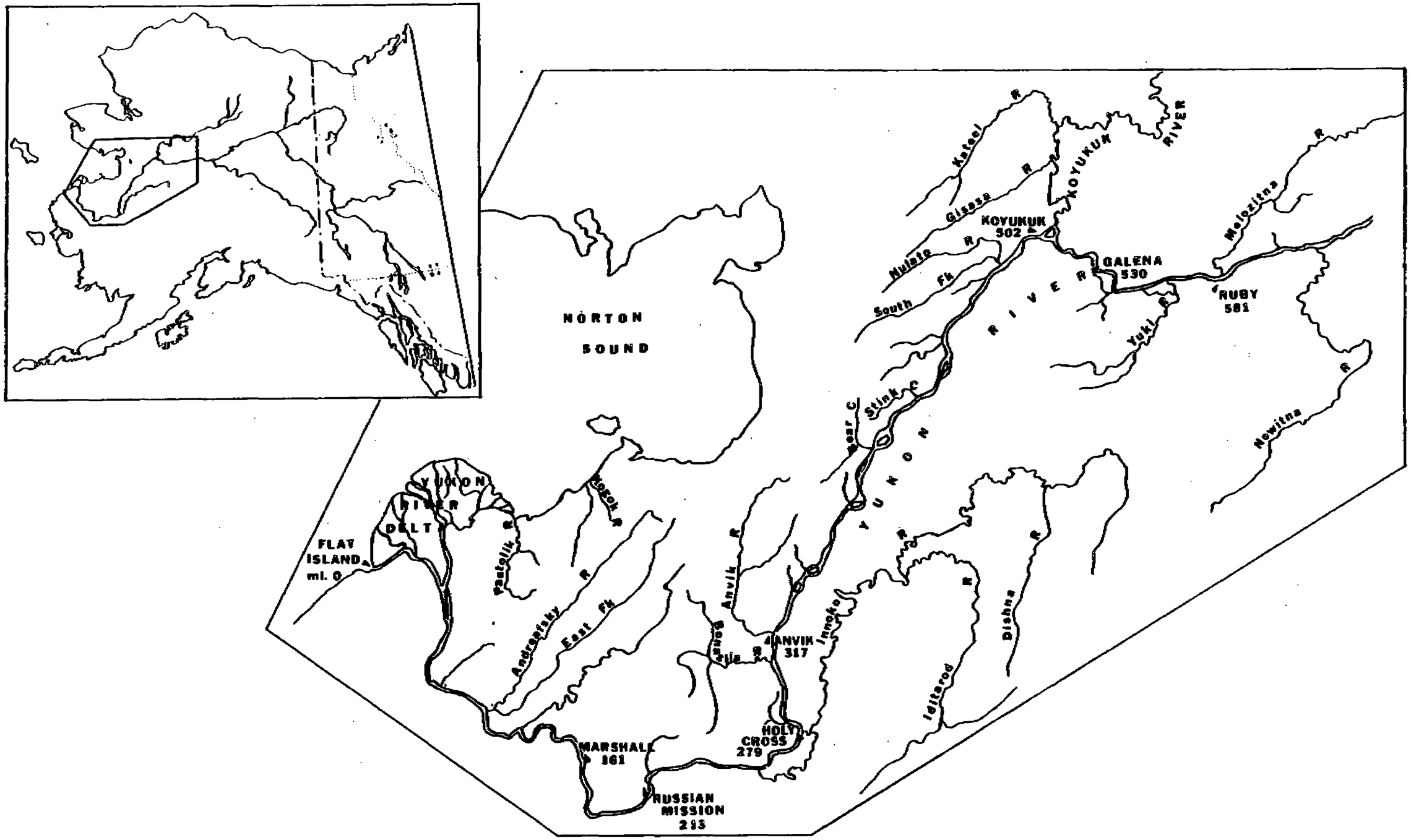


Figure 2. The lower Yukon River drainage.

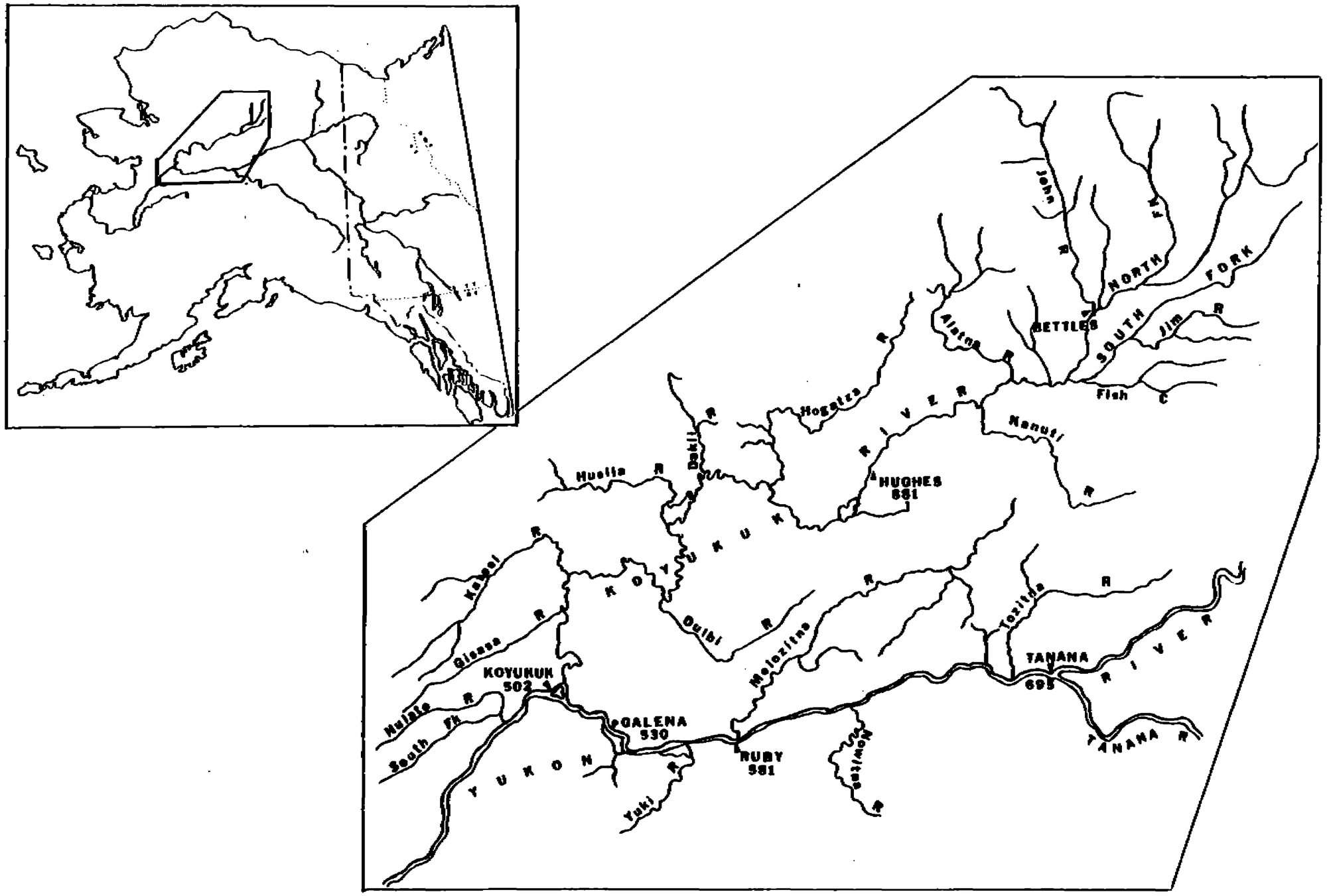


Figure 3. The Koyukuk River drainage.

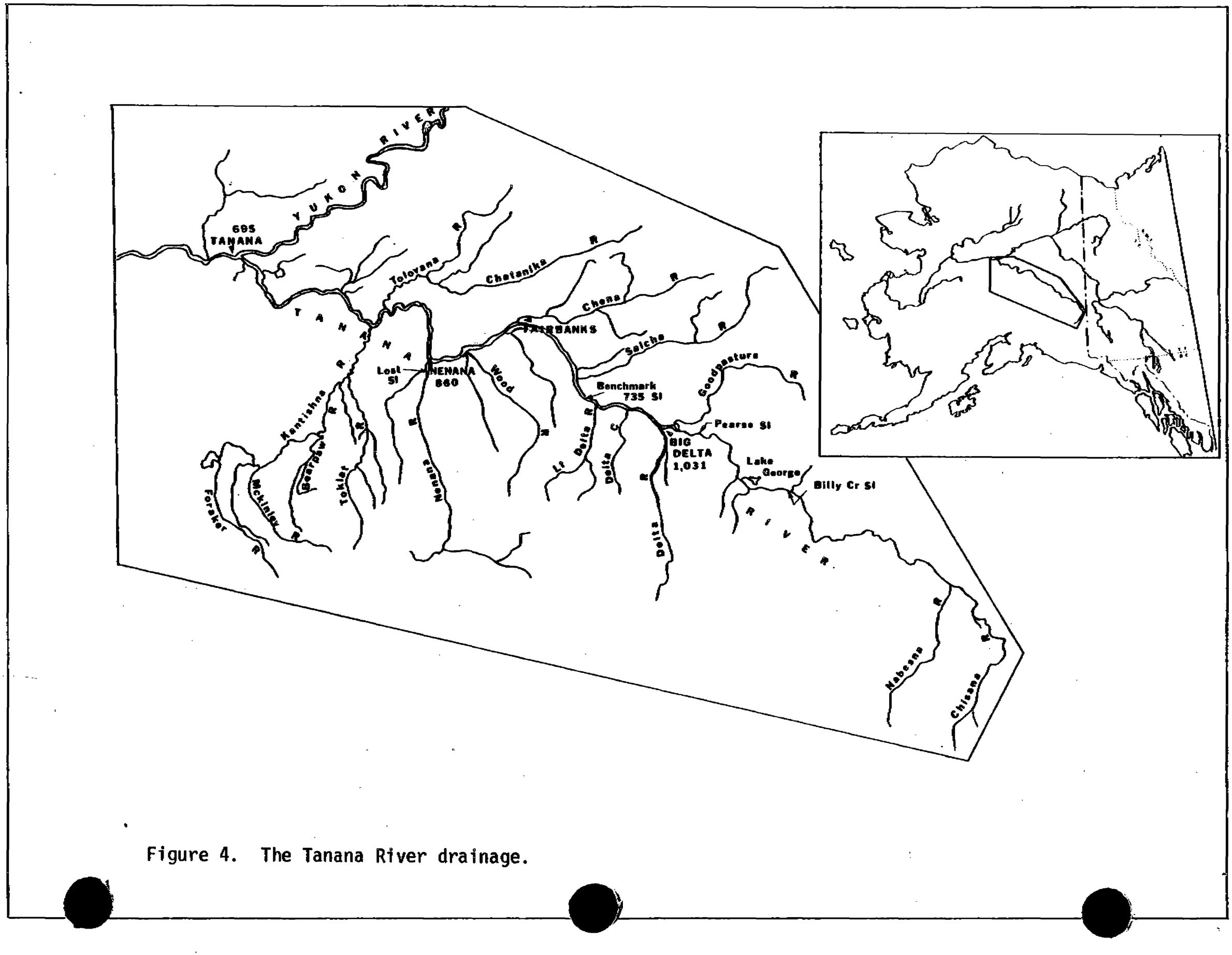


Figure 4. The Tanana River drainage.

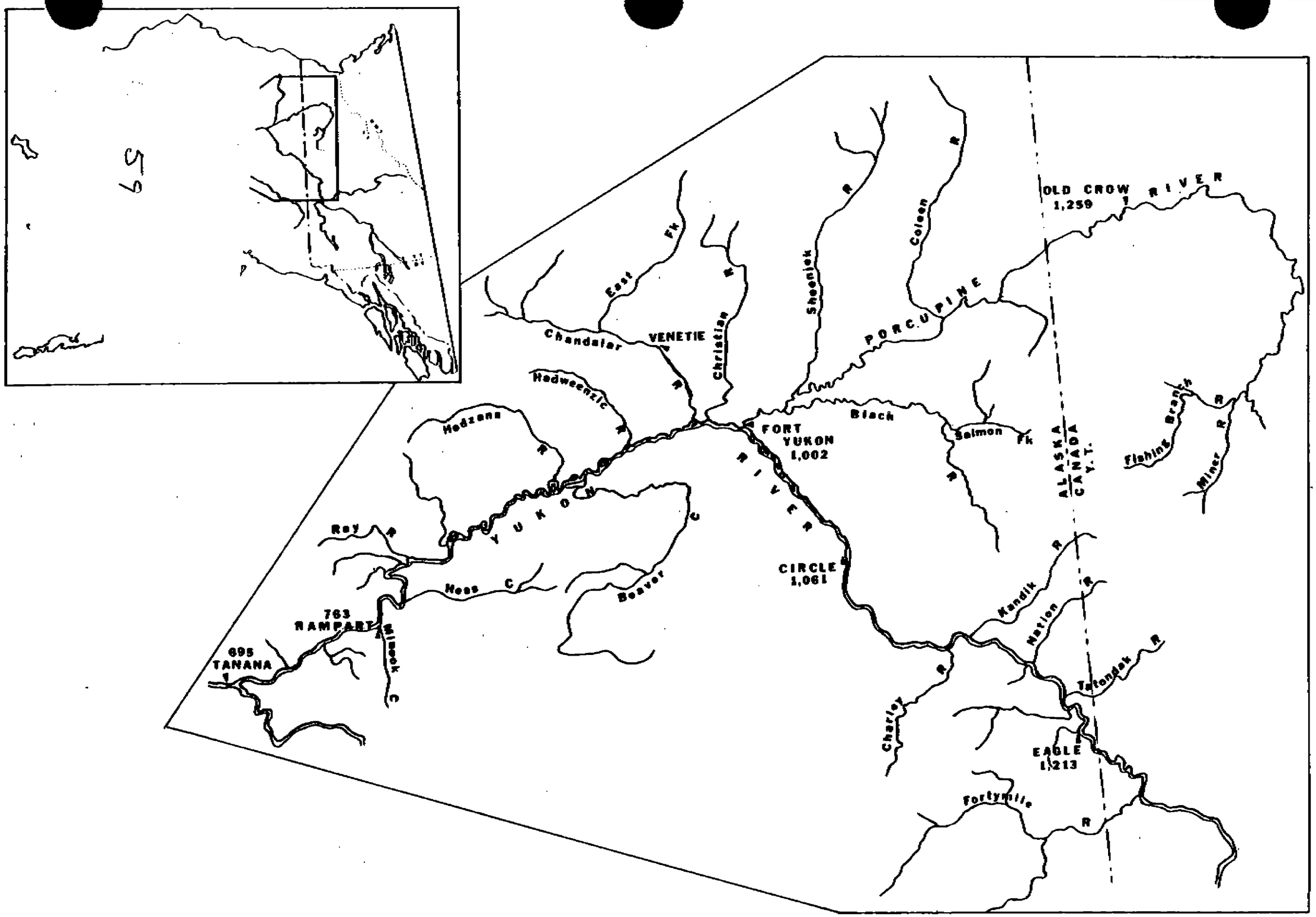


Figure 5. The middle Yukon River and Porcupine River drainage.

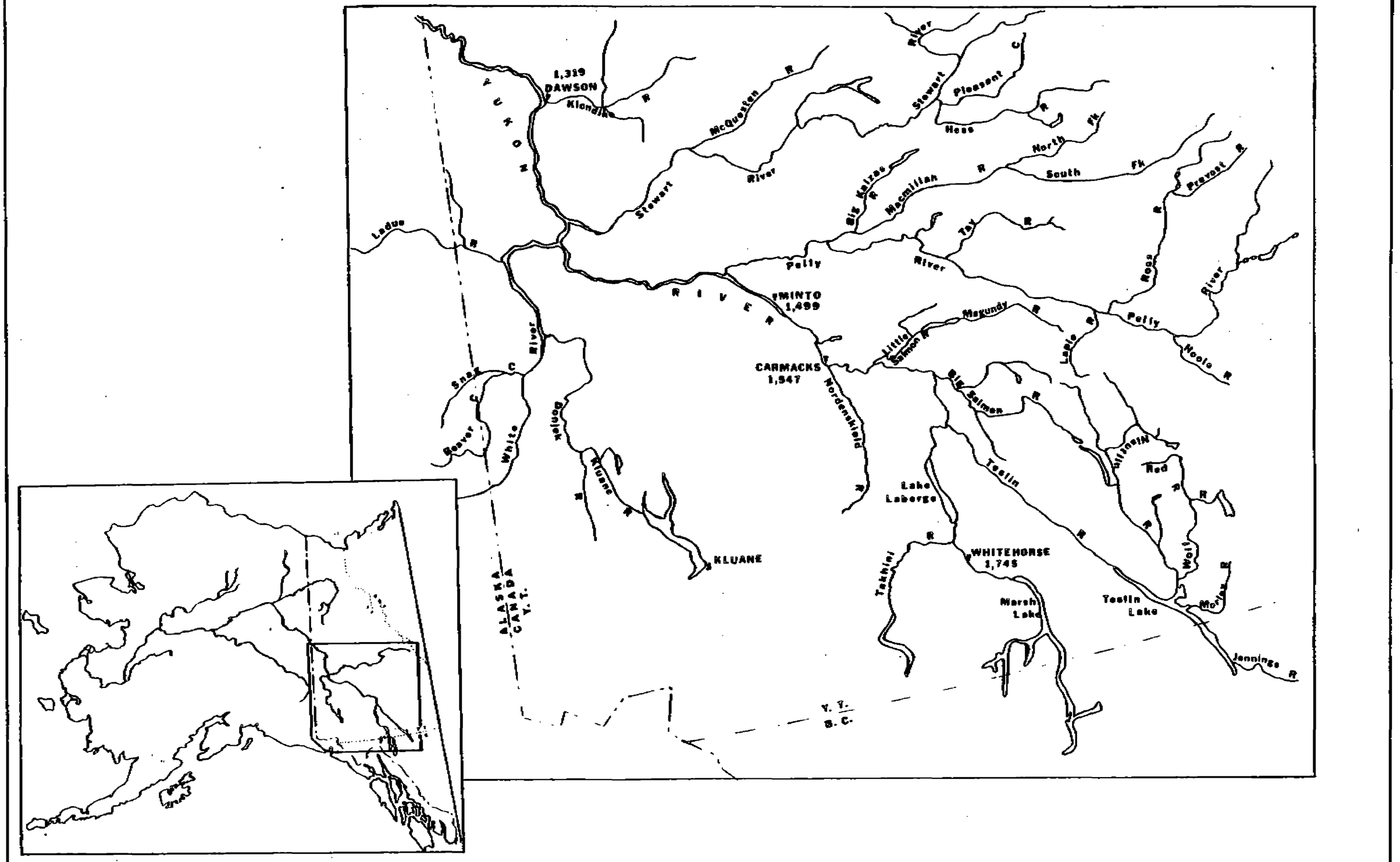


Figure 6. The upper Yukon River drainage.

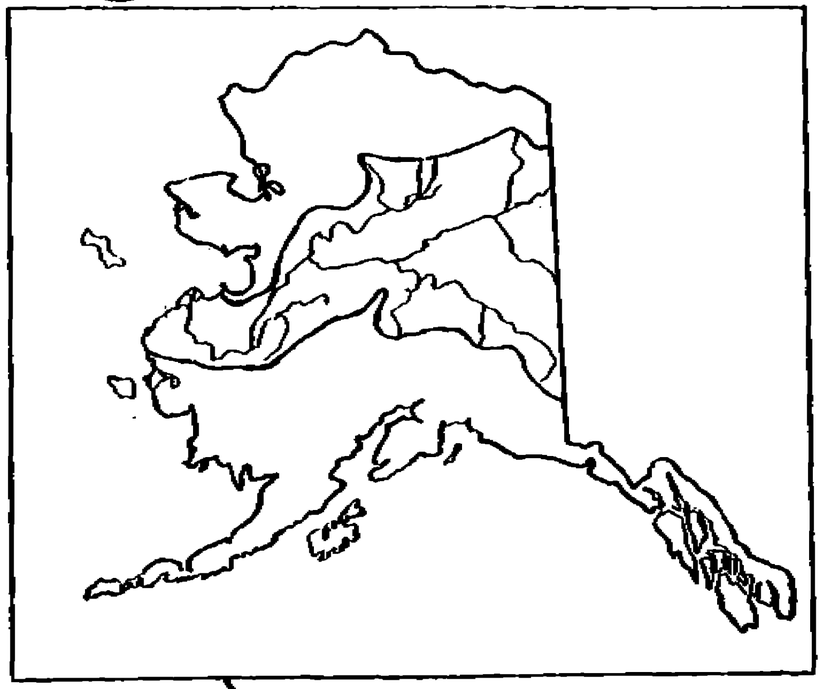


Figure 7. Districts 1-6 of Yukon management area.

YUKON RIVER DELTA

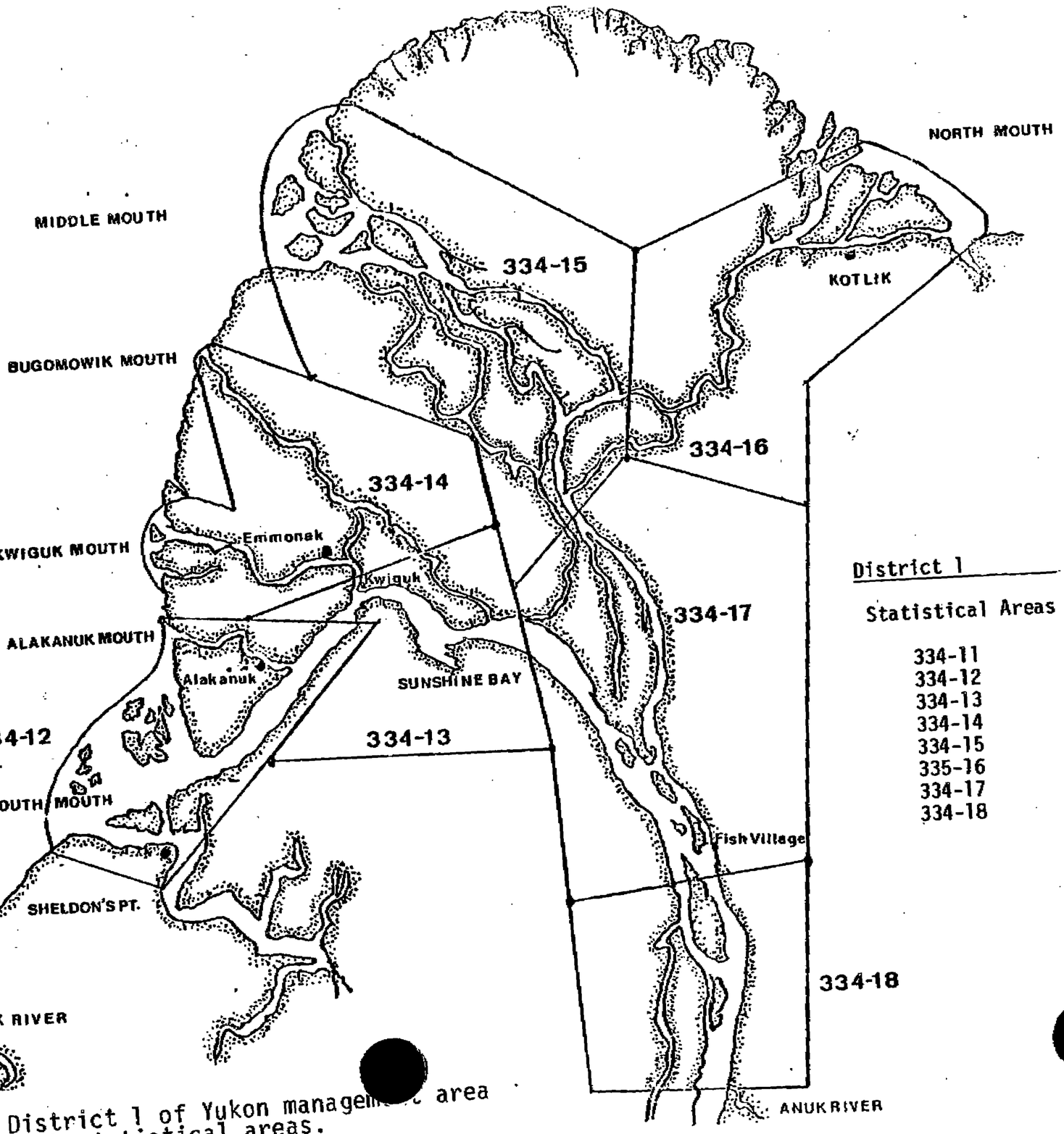
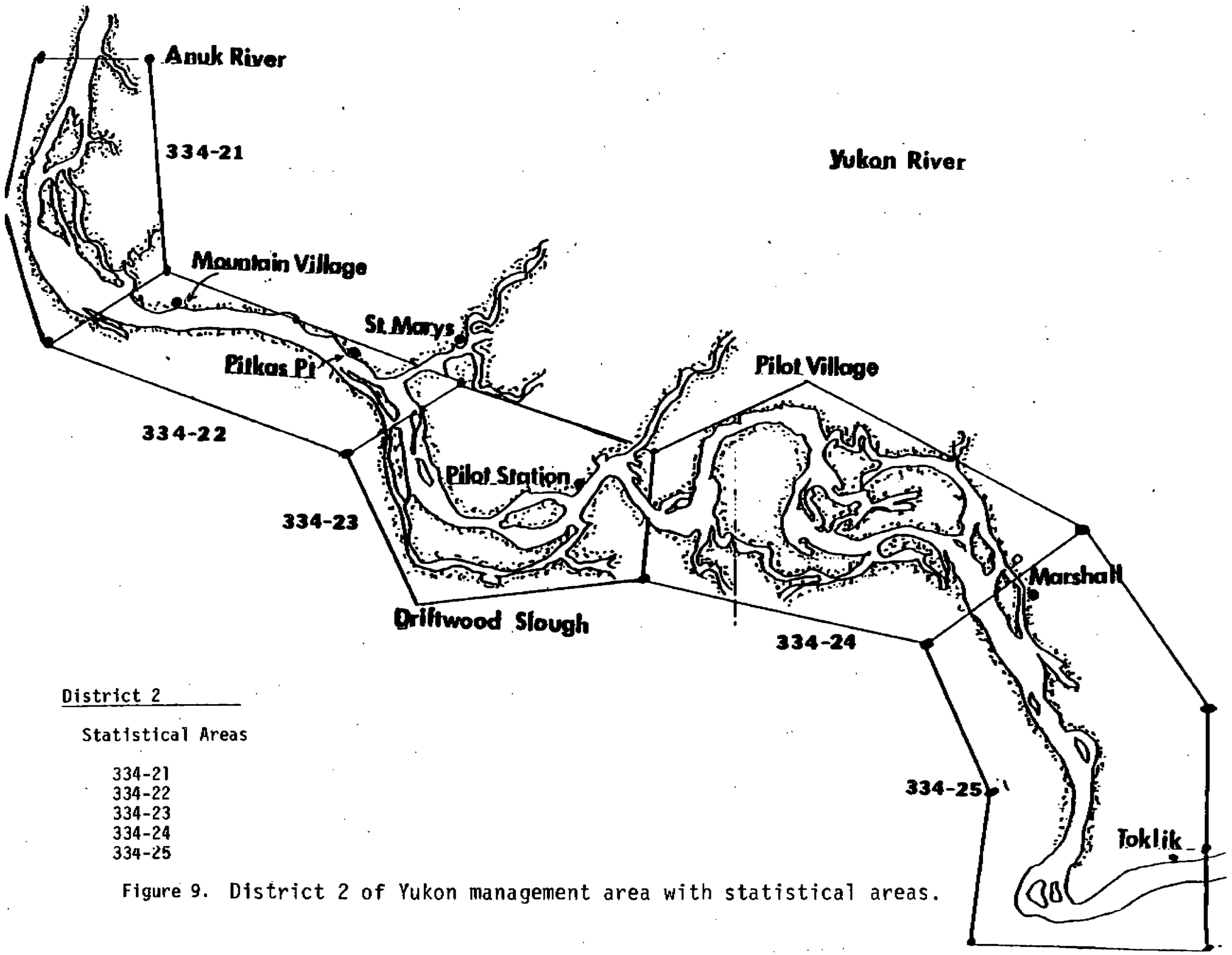


Figure 8. District 1 of Yukon management area with statistical areas.



District 2

Statistical Areas

334-21
334-22
334-23
334-24
334-25

Figure 9. District 2 of Yukon management area with statistical areas.

District 3

Statistical Areas

334-31
334-32

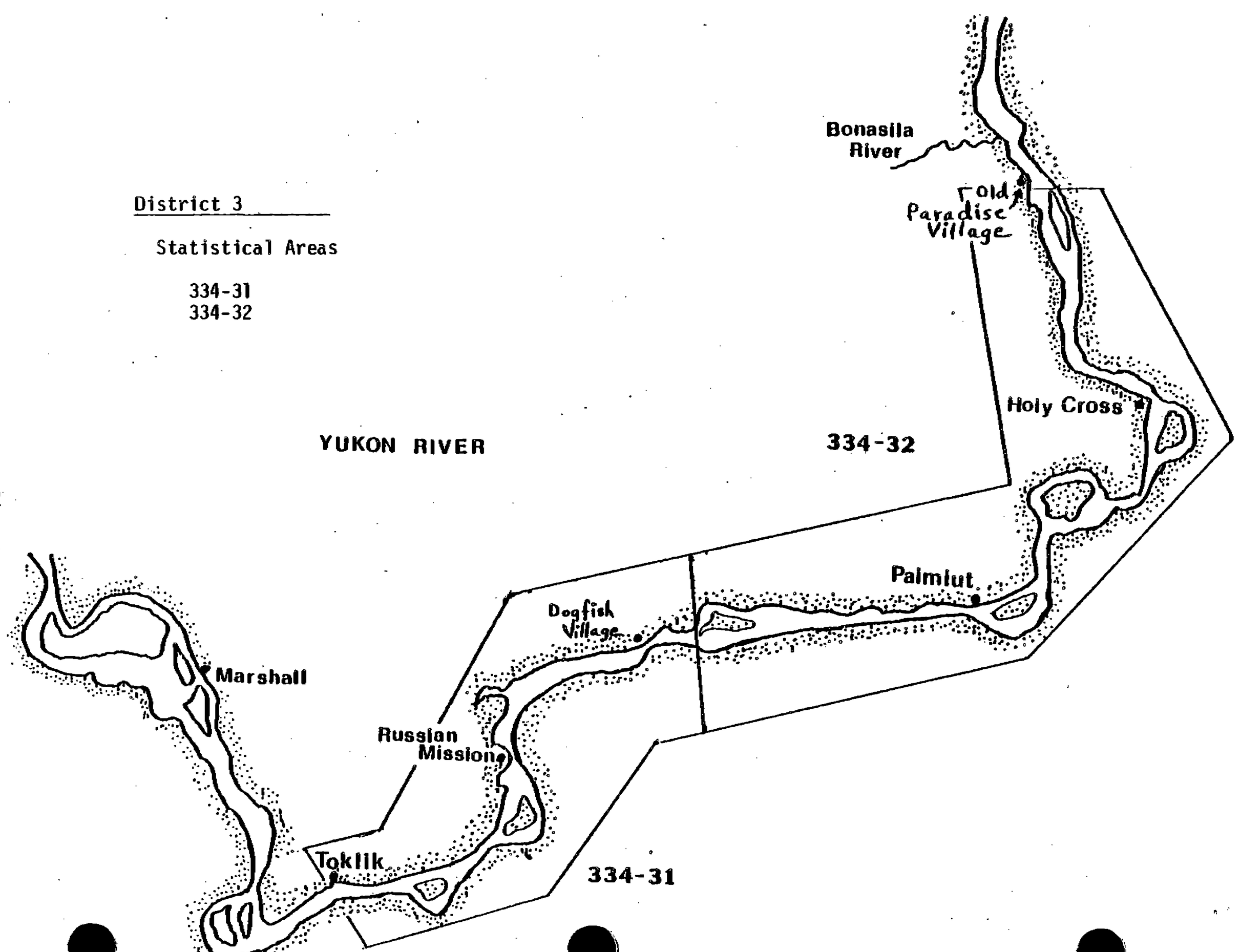
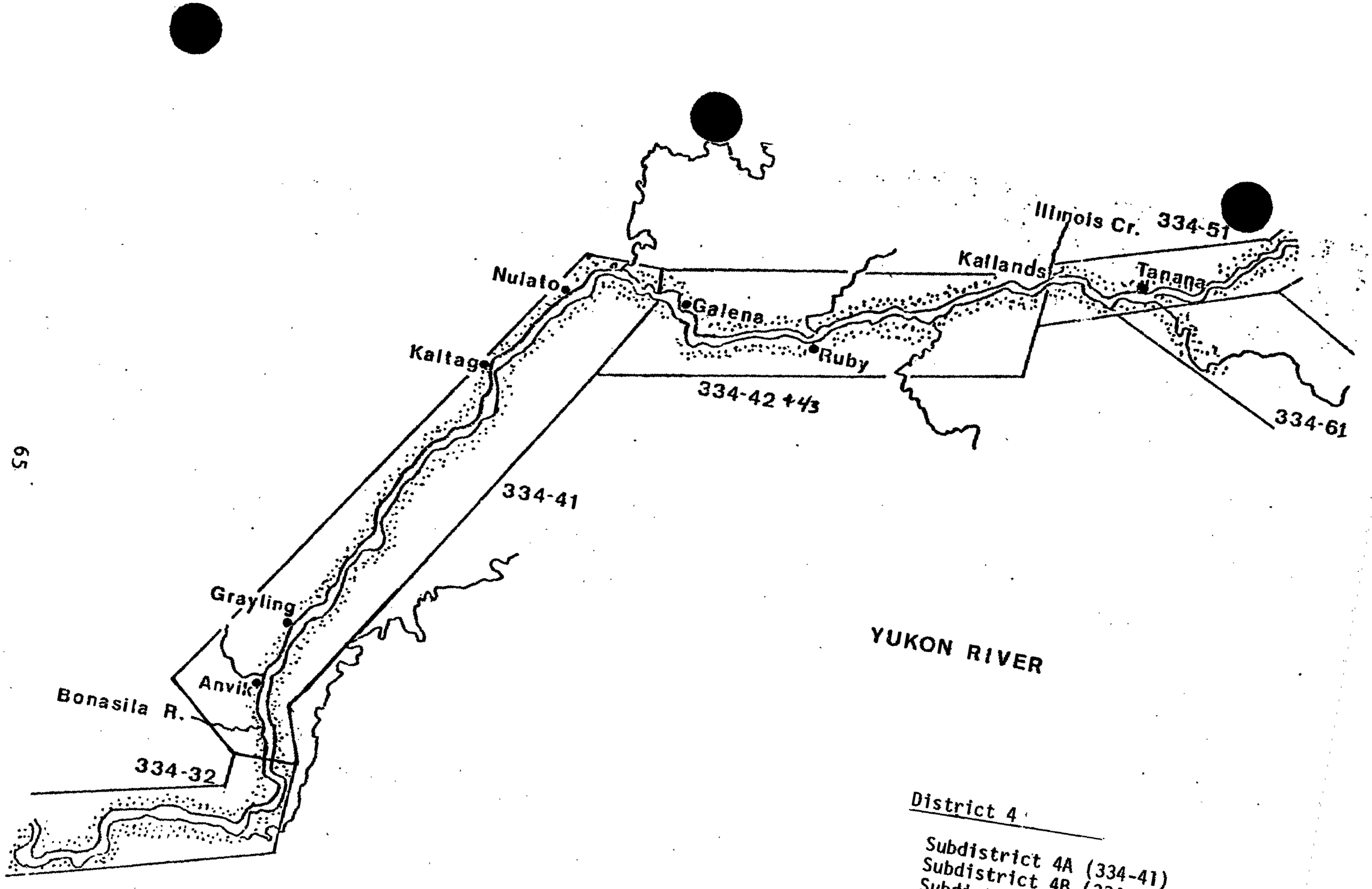


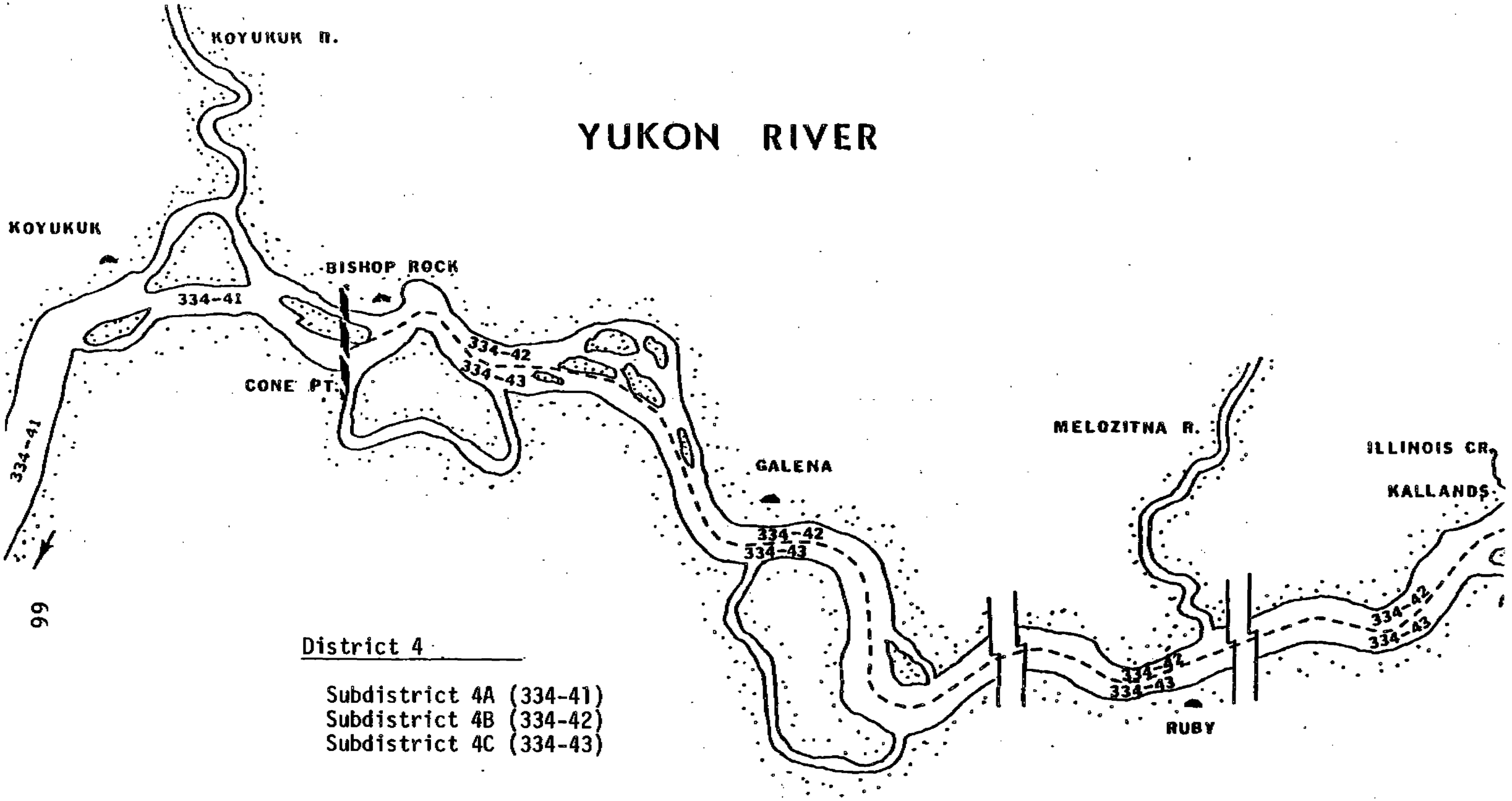
Figure 10. District 3 of Yukon management area with statistical areas.



District 4

Subdistrict 4A (334-41)
Subdistrict 4B (334-42)
Subdistrict 4C (334-43)

Figure 11. District 4 of Yukon management area with statistical areas.



District 4

Subdistrict 4A (334-41)
Subdistrict 4B (334-42)
Subdistrict 4C (334-43)

Figure 12. District 4 of Yukon management area with statistical areas.

District 5:

Subdistrict	5A	(334-51)
Subdistrict	5B	(334-52)
Subdistrict	5C	(334-53)
Subdistrict	5D	(334-54)

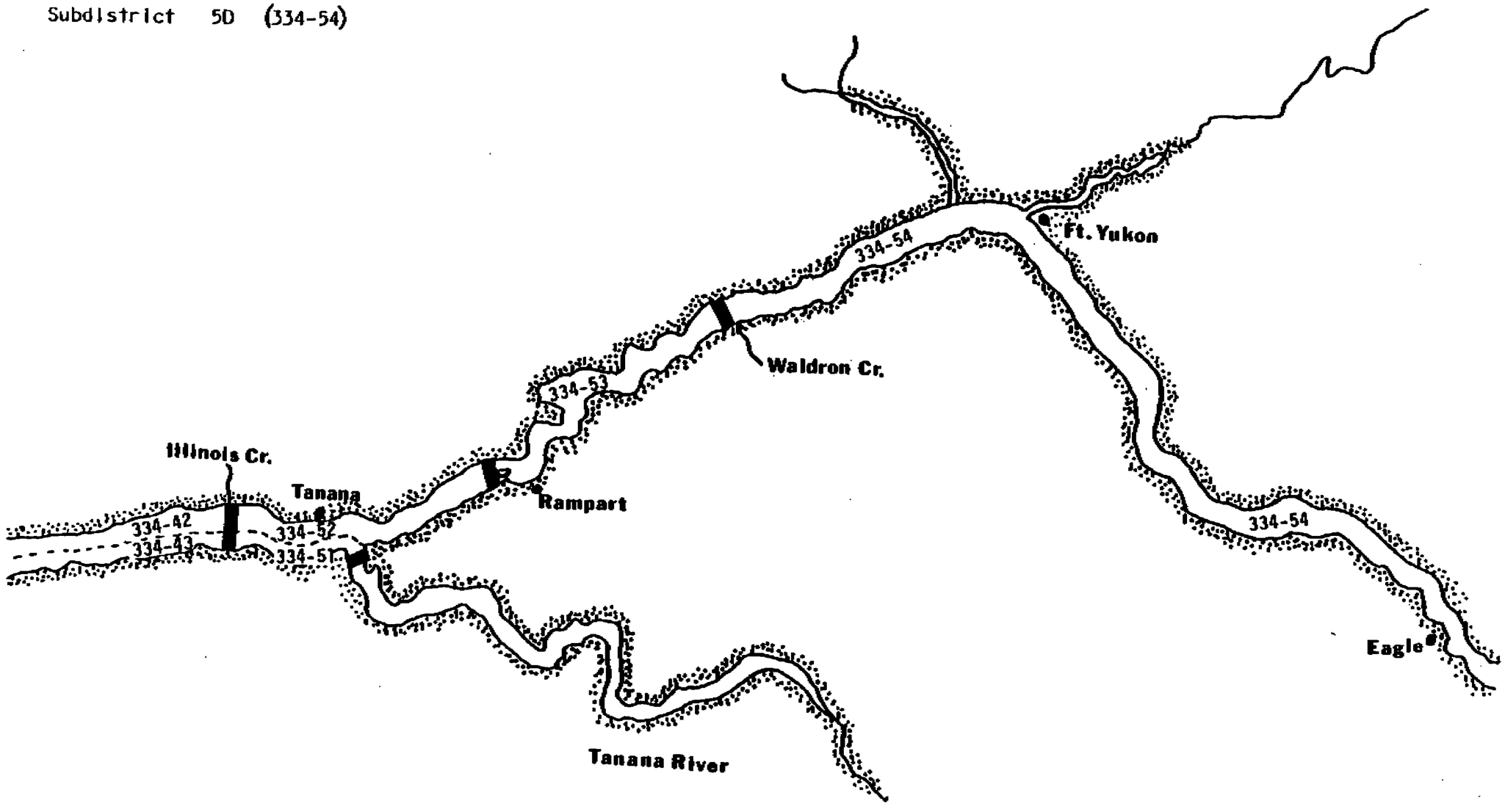
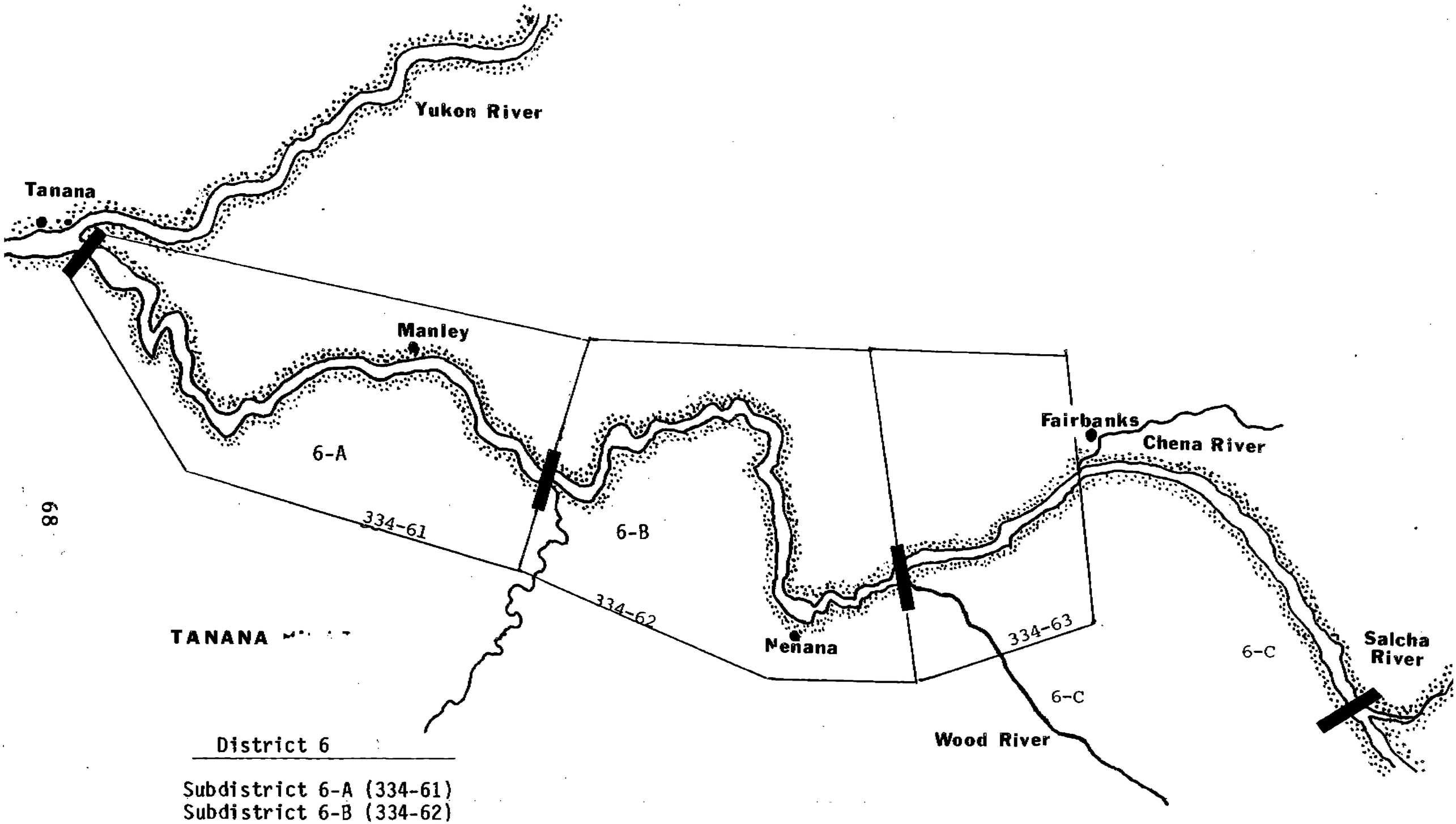


Figure 13. District 5 of Yukon management area with statistical areas.



District 6

Subdistrict 6-A (334-61)
Subdistrict 6-B (334-62)
Subdistrict 6-C
Wood River to Chena R. (334-63)

Figure 14. District 6 of Yukon management area with statistical areas.

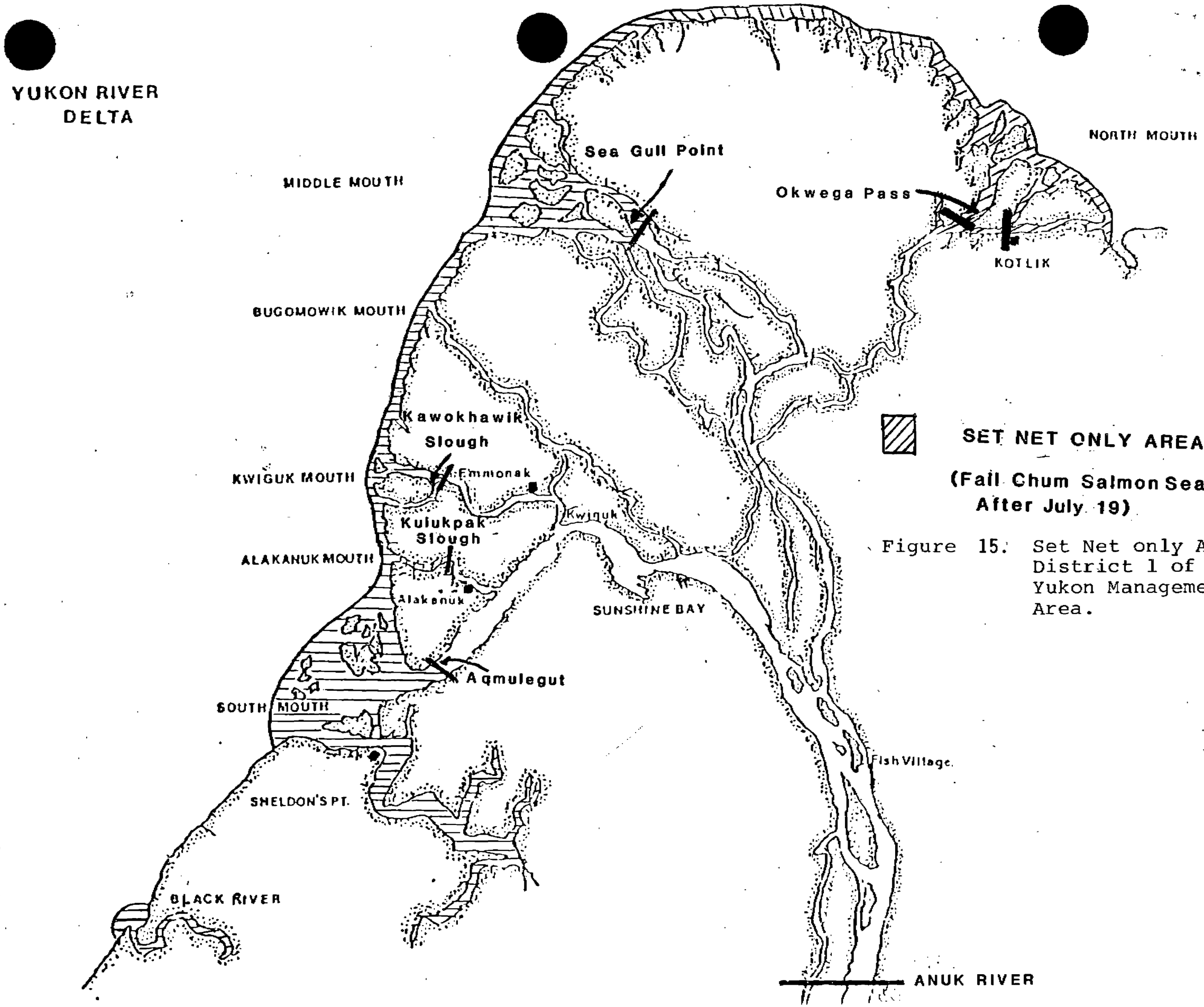


Figure 15. Set Net only Area
District 1 of the
Yukon Management
Area.

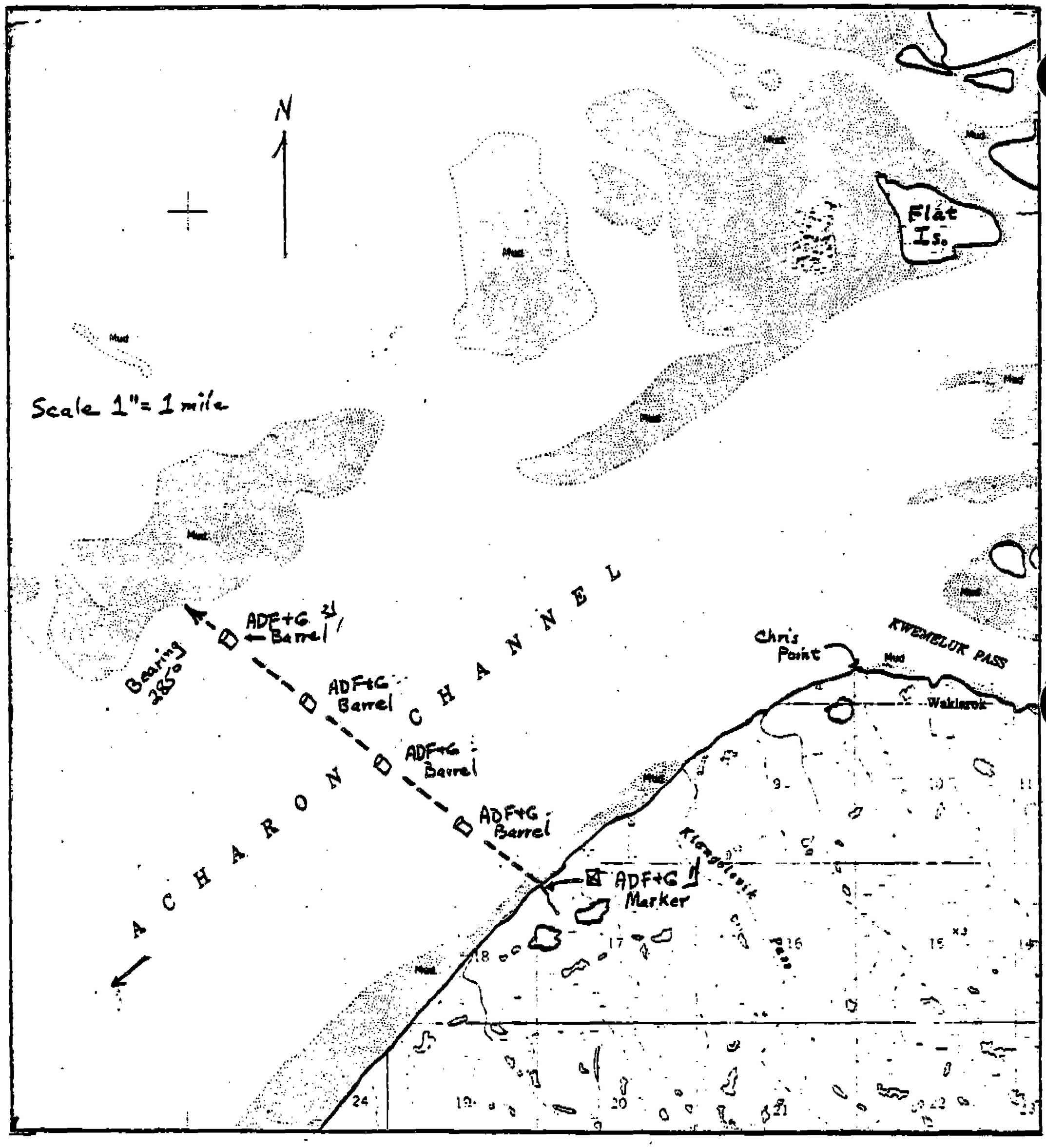


Figure 16. Closed waters Acharon Channel, south mouth Yukon River. (5AAC 05.350. CLOSED WATERS. (1) Acharon Channel of the south mouth area of the Yukon River west of a 2-1/2 nautical mile long line bearing 285° from an ADF&G regulatory marker located below Chris Point to the opposite side of the channel; the line may be marked by a series of yellow and green barrels placed by the Department between shore markers).

1/ ADF&G Regulatory Marker Sign, erected 5' height with driftwood logs, located on river bank at terminus of rivulet between two lakes approximately 2-1/2 miles below Chris Point.

2/ ADF&G yellow and green 55 gal. barrels anchored offshore.

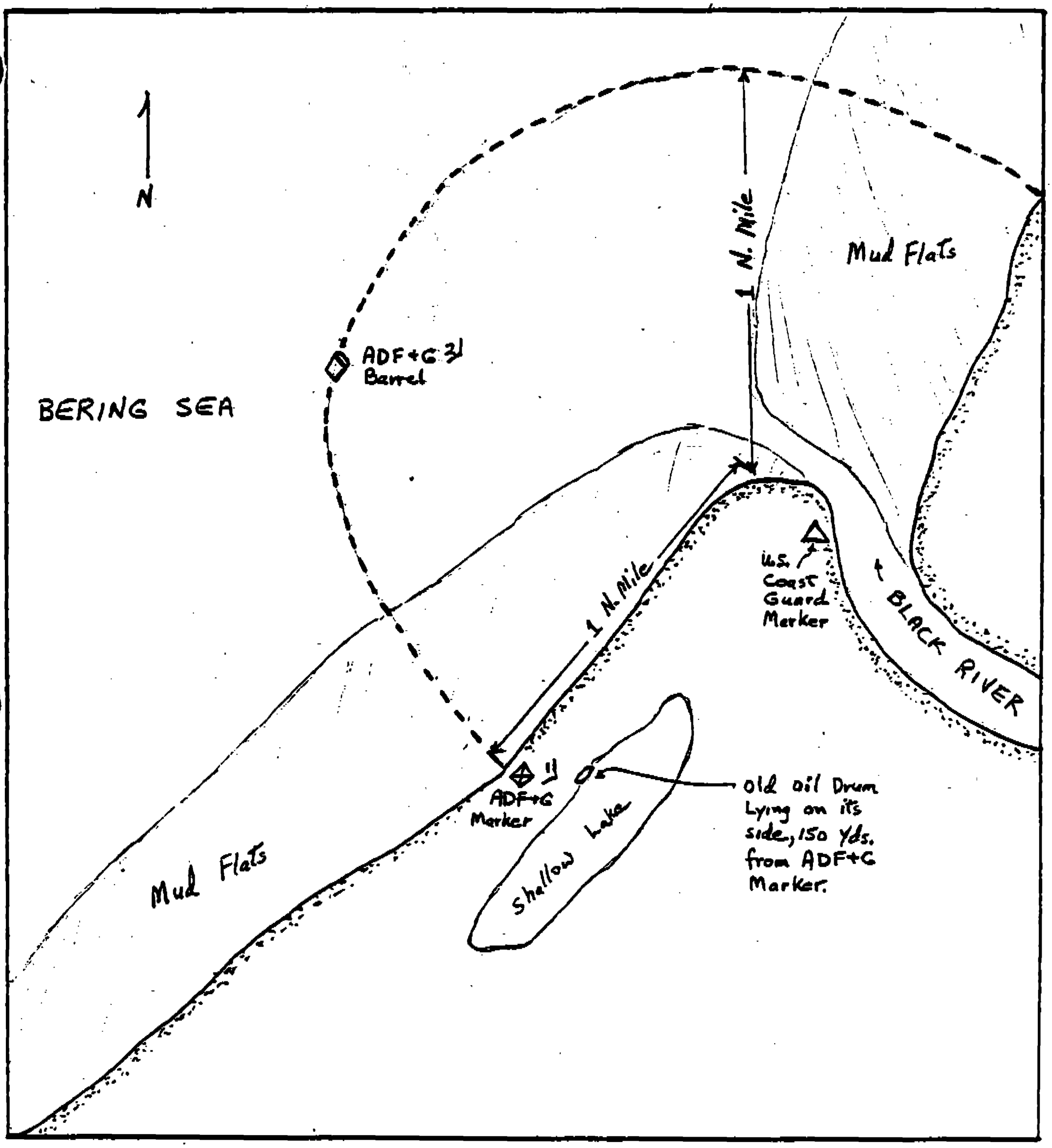


Figure 17. Closed waters of Black River mouth. (5AAC 05.350. CLOSED WATERS. (3) waters west of a one nautical mile radius from the mouth of Black River).

1/ ADF&G Regulatory Marker Sign erected 6' height with driftwood logs.

2/ ADF&G yellow and green 55 gal. barrel anchored 1 nautical mile offshore.

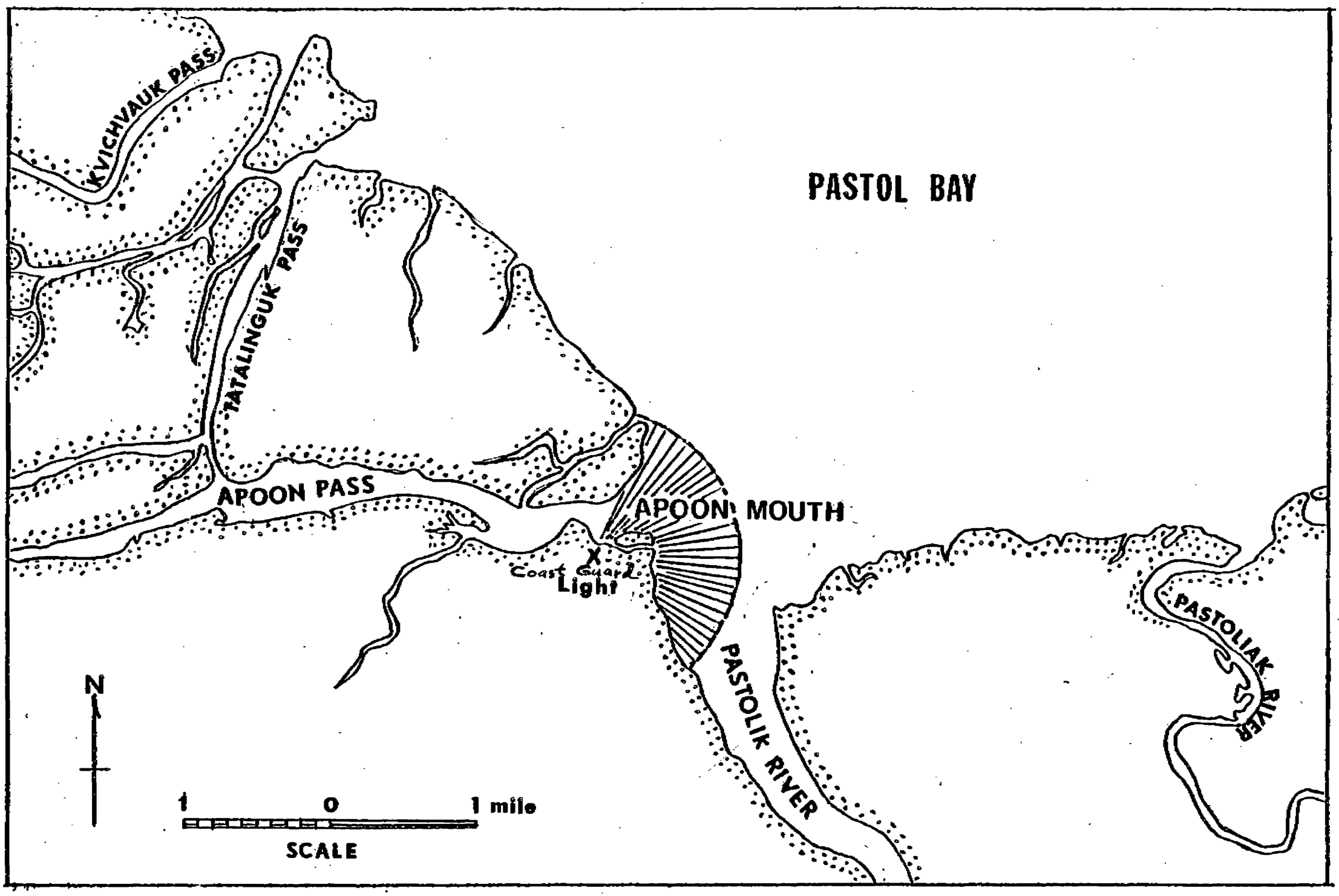


Figure 18. Closed waters of Apoon Mouth, Yukon River (5 AAC 05.350. CLOSED WATERS. (9) Waters east of a one nautical mile radius from a U.S. Coast Guard light at the mouth of Apoon Pass).

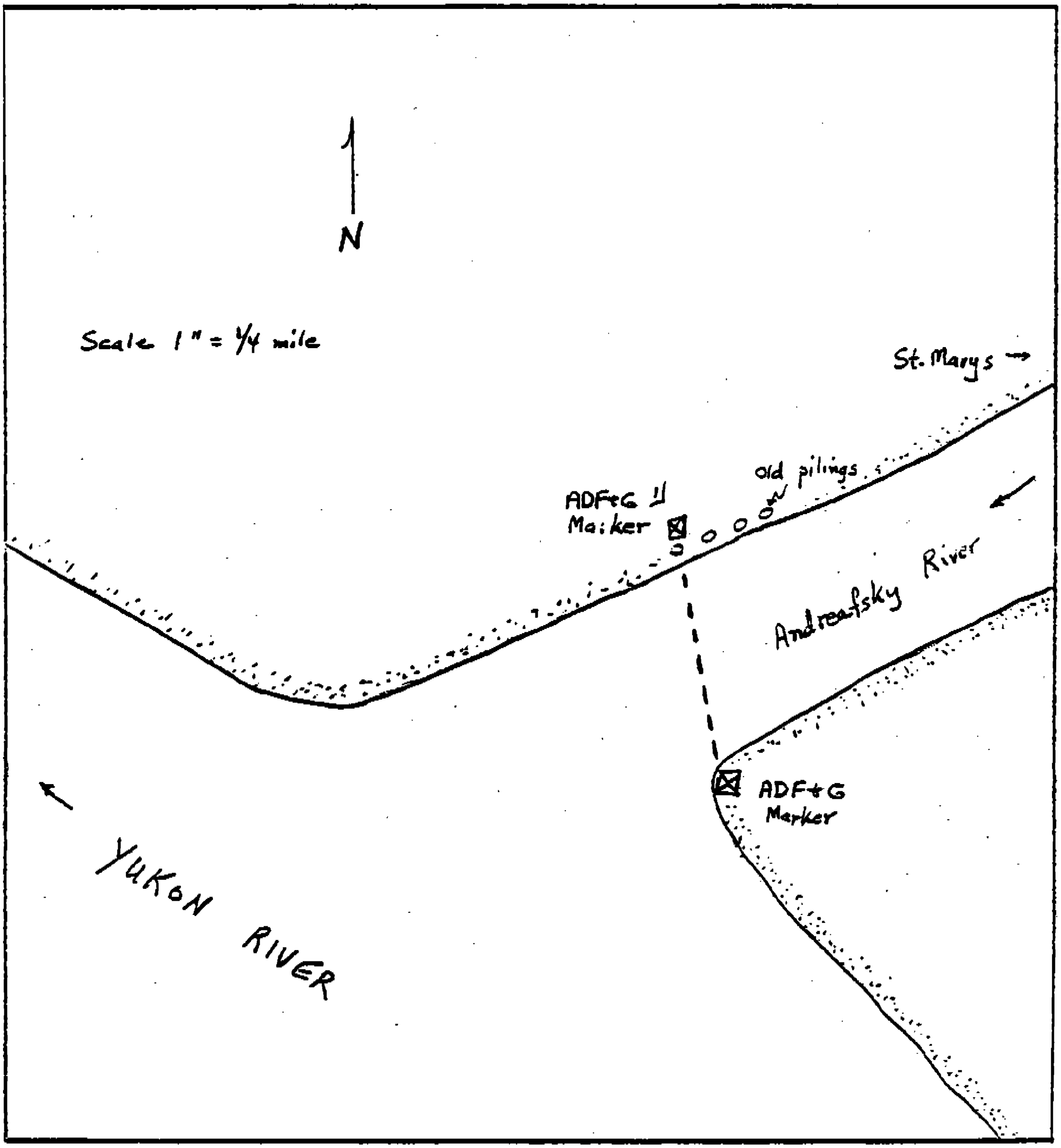


Figure 19. Closed waters of Andreafsky River mouth. (5AAC 05.350. CLOSED WATERS. (4) waters of the Andreafsky River upstream of a line from Department regulatory markers placed on each side of the river at its mouth).

1/ North bank ADF&G regulatory marker sign attached to 4th wooden piling stump downstream.

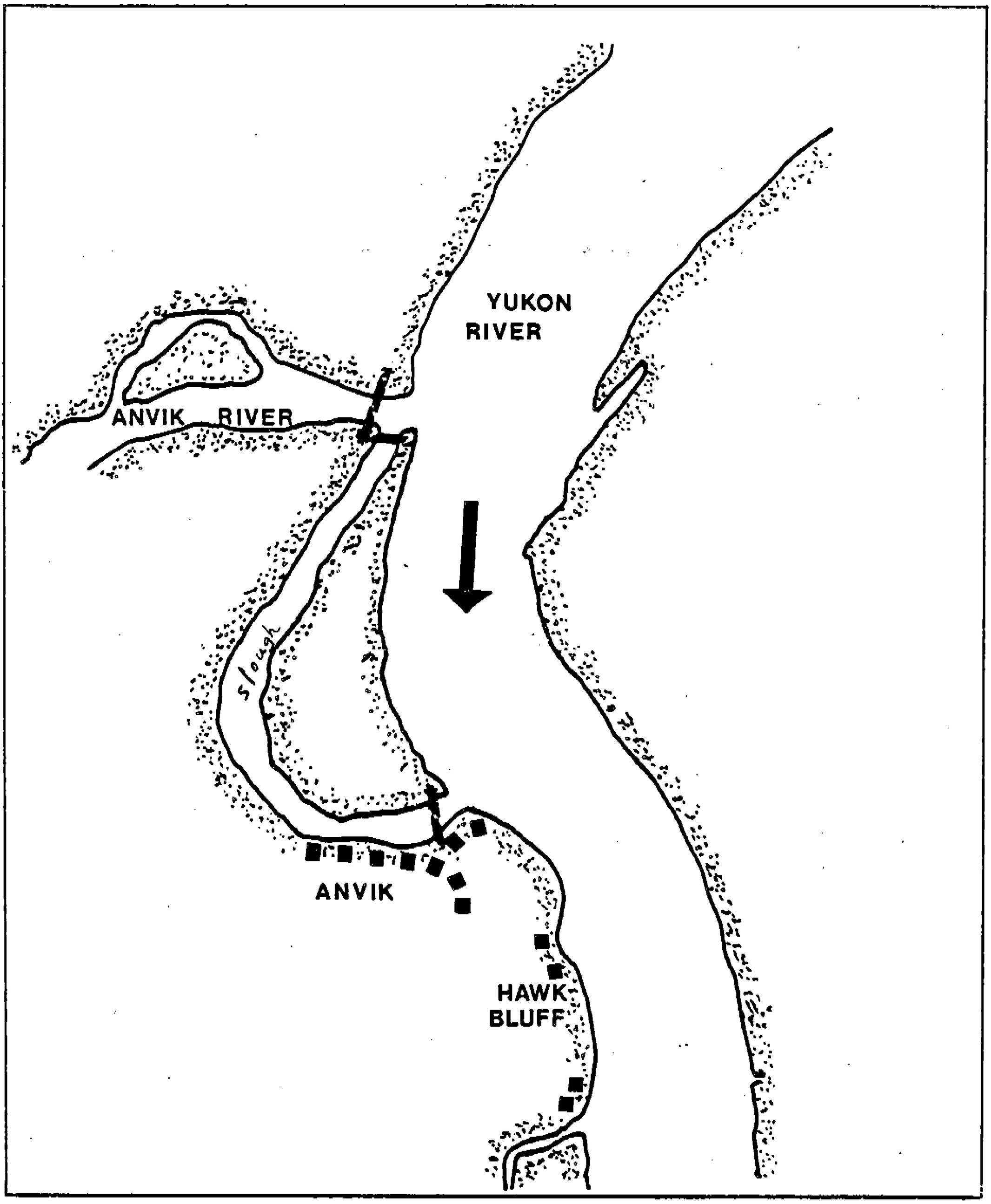


Figure 20. Closed waters of Anvik River mouth. (5AAC 05.350. (CLOSED WATERS.(8) waters of the Anvik River upstream of a line between department r[illegible]- tory markers placed on each side of the river at its mouth). Marke[illegible] (6) placed north and south banks of the Anvik River mouth and at up- stream and downstream mouths of slough (Old Anvik River Channel).

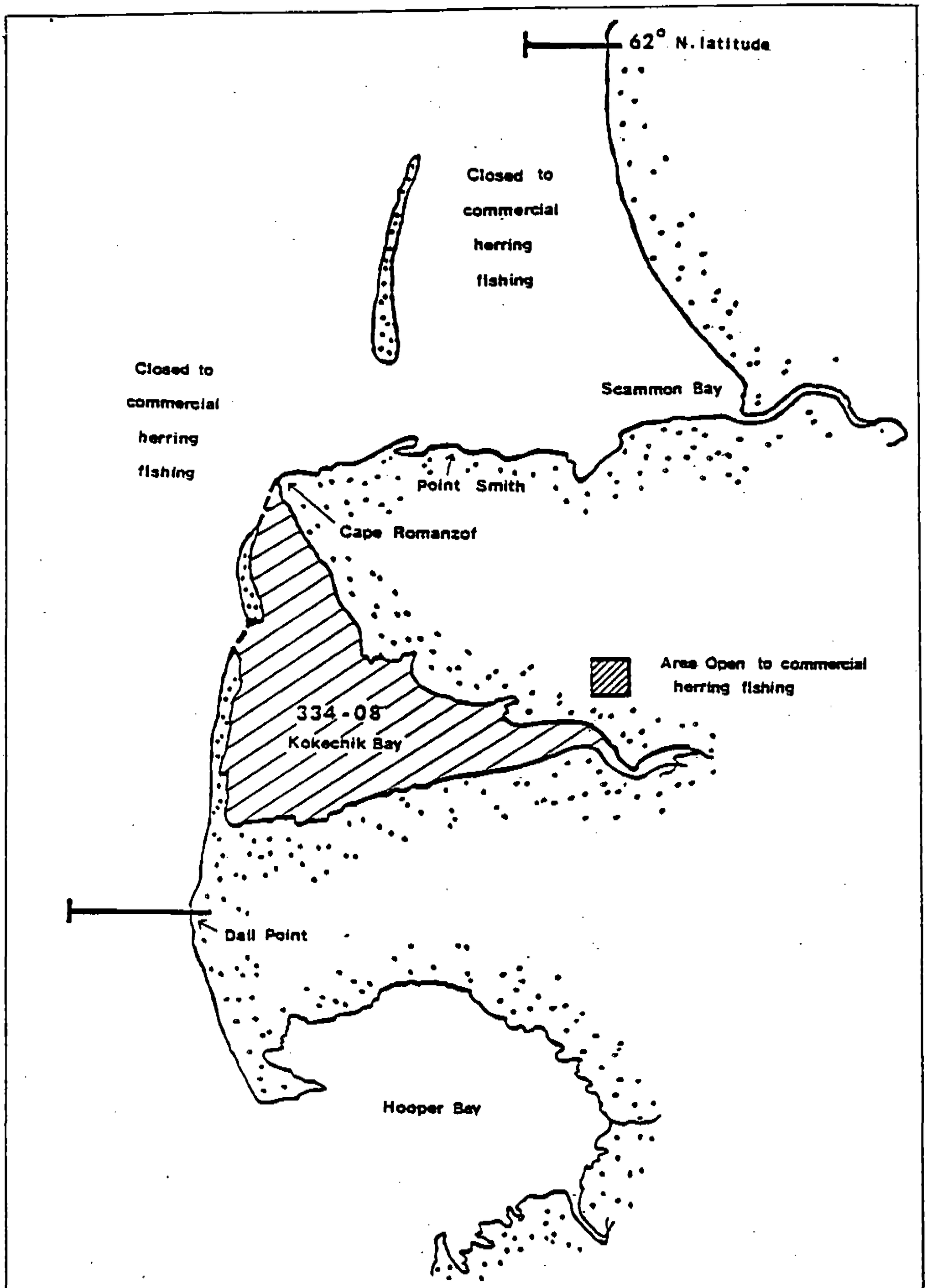


Figure 21. Cape Romanzof District.

Table 1. List of indigenous fishes found in the Yukon area. 1/

Species Code	Scientific Name	Common Name
601	Lampetra japonica	Arctic lamprey
570	Stenodus leucichthys	Sheefish
588	Coregonus nasus	Broad Whitefish
589	Coregonus pidschian	Humpback Whitefish
583	Coregonus sardinella	Least Cisco
585	Coregonus laurettae	Bering Cisco
586	Prosopium cylindraceum	Round Whitefish
587	Prosopium coulteri	Pygmy Whitefish
610	Thymallus arcticus	Arctic Grayling
550	Salvelinus namaycush	Lake Trout
520	Salvelinus alpinus	Arctic Char
530	Salvelinus malma	Dolly Varden
410	Oncorhynchus tshawytscha	King Salmon
420	Oncorhynchus nerka	Sockeye Salmon
430	Oncorhynchus kisutch	Coho Salmon
440	Oncorhynchus gorbusch	Pink Salmon
450	Oncorhynchus keta	Chum Salmon
513	Osmerus mordax dentex	Rainbow Smelt
514	Hypomesus olidus	Pond Smelt
500	Esox lucius	Northern Pike
630	Dallia pectoralis	Blackfish
650	Couesius plumbeus	Lake Chub
640	Catostomus catostomus	Longnose Sucker
670	Petcopsis omiscomaycus	Trout-Perch
590	Lota lota	Burbot, Lush
661	Pungitius pungitius	Nine-spine Stickleback
162	Cottus cognatus	Slimy Sculpin
ESTUARINE		
113	Eleginus gracilis	Saffron Cod
129	Platichthys stellatus	Starry Flounder
	Liopsetta glacialis	Arctic Flounder
230	Clupea pallasii	Pacific Herring
516	Mallotus villosus	Capelin

1/ Includes fishes found in the Yukon River drainage in Canada.

Table 2 . Yukon River Drainage Mileages

Location	Mileages from Mouth
North Mouth (Apoon Pass)	
Kotlik	6
Hamilton	26
Middle Mouth (Kwikpak, Kawanak Pass)	
Choolunawick	16
Akers Camp	26
New Hamilton	34
South Mouth (Kwikluak Pass)	
Mouth, Black River	-18
Flat Island	0
Sheldon Point	5
Tin Can Point	8
Alakanuk	17
Emmonak-Kwiguk (Kwiguk Pass)	24
Sunshine Bay	24
Aproka Pass (upstream mouth)	35
Kwikpak Pass (upstream mouth)	44
Head of Passes	48
Fish Village	52
Mouth Anuk River (District 1/2 Boundary)	63
Patsys Cabin	71
Mountain Village	87
Old Andreafsky	97
Pitkas Point	103
Mouth, Andreafsky River	104
St. Marys	107
Pilot Station	122
Mouth, Atchuelinguk (Chulinak) River	126
Pilot Village	138
Marshall (Fortuna Ledge)	161
Upstream Mouth Owl Slough	163
Ingrihak	170
Ohogamut	185
Toklik (District 2/3 Boundary)	191
Kakamut	193
Russian Mission	213
Dogfish village	227
Paimuit	251
Mouth, Innoko River (South Slough)	274

Shageluk	328
Holikachuk	383
Holy Cross	279
Mouth, Koserefski River	286
Old Paradise Village (District 3/4 Boundary)	301
Mouth, Bonasila River	306
Anvik	317
Mouth, Anvik River	318
Grayling	336
Mouth, Thompson Creek	349
Blackburn	370
Eagle Slide	402
Mouth, Rodo River	447
Kaltag	450
Mouth, Nulato River	483
Nulato	484
Koyukuk	502
Mouth, Koyukuk River	508
Mouth, Gisasa River	564
Huslia	711
Mouth, Dakli River	755
Mouth, Hogatza River	780
Hughes	881
Mouth, Kanuti River	935
Alatna (Mouth, Alatna River)	956
Allakaket	956
Mouth, South Fork	986
Mouth, John River	1,117
Bettles	1,121
Middle Fork	1,141
Cold Foot	1,174
Wiseman	1,186
Bishop Rock	514
Prospect Point	519
Galena	530
Whiskey Creek	555
Mouth, Yuki River	562
Ruby	581
Mouth, Melozitna River	583
Horner Hot Springs	605
Kokrines	608
Mouth, Nowitna River	612
Birches	647
Kallands - Mouth of Illinois Creek (District 4/5 Boundary)	664
Mouth, Tozitna River	681
Tanana Village	695
Mouth, Tanana River (District 5/6 Boundary)	695
Manley Hot Springs	765
Mouth, Kantishna River	793
Mouth, Toklat River	838
Mouth, Sushana River	850
Mouth, Bearpaw River	887
Outlet, Lake Minchumina	959

Minto	835
Nenana	860
Mouth, Nenana River	860
Mouth, Wood River	894
Rosie Creek Bluffs	912
Mouth, Chena River (Fairbanks)	920
Mouth, Salcha River	965
Benchmark #735 Slough	991
Mouth, Little Delta River	1,000
Mouth, Delta Creek	1,014
Mouth, Clear Creek (Richardson-Clearwater)	1,015
Mouth, Shaw Creek	1,021
Mouth, Delta River (Big Delta)	1,031
Delta Junction	1,041
Mouth, Goodpaster River	1,049
Bluff Cabin Slough	1,050
Outlet, Clearwater Lake	1,052
Mouth, Clearwater Creek, (Delta Clearwater)	1,053
Mouth, Gerstle River	1,059
Outlet, Healy Lake	1,071
Outlet, Lake George	1,086
Tanacross	1,128
Outlet, Tetlin Lake	1,188
Mouth, Nabesna River	1,210
Northway Junction	1,214
Mouth, Chisana River	1,215
Mouth, Sheep Creek	1,297
Rampart Rapids	731
Rampart	763
Mouth, Hess Creek	789
Mouth, Ray River	817
Highway Bridge - Pipeline Crossing	820
Mouth, Dall River	841
Stevens Village	847
Mouth, Hodzana River	897
Beaver	932
Mouth, Hadweenzic River	952
Mouth, Chandalar River (Venetie Landing)	982
Venetie	1,025
Fort Yukon	1,002
Mouth, Porcupine River	1,002
Mouth, Black River	1,026
Chalkyitsik	1,084
Mouth, Salmon River	1,142
Mouth, Salmon Trout River	1,193
Mouth, Sheenjek River	1,054
Mouth, Coleen River	1,157
U.S.-Canadian Border	1,219
Old Crow	1,259
Fishing Branch River spawning area	1,600
Circle	1,061
Woodchopper	1,110
Mouth, Charley River	1,124

Mouth, Kandik River	1,135
Mouth, Nation River	1,166
Mouth, Tatonduk River	1,186
Mouth, Seventymile River	1,194
Eagle	1,213
U.S.-Canadian Border	1,224
Mouth Fortymile River	1,269
Dawson	1,319
Mouth, Klondike River	1,320
Mouth, Sixty Mile River	1,369
Mouth, Stewart River	1,375
McQuesten	1,455
Stewart Crossing	1,491
Mayo	1,520
Mouth, Hess River	1,594
Mouth, White River	1,386
Mouth, Donjek River	1,455
Mouth Kluane River	1,541
Outlet Kluane Lake	1,587
Burwash Landing	1,595
Kluane	1,625
Fort Selkirk	1,477
Mouth, Pelly River	1,478
Pelly Crossing	1,410
Mouth, MacMillan River	1,442
Ross River	1,602
Minto	1,499
Mouth, Tatchun Creek	1,530
Carmacks	1,547
Mouth, Little Salmon River	1,583
Mouth, Big Salmon River	1,621
Mouth, North Big Salmon River	1,641
Mouth, South Big Salmon River	1,657
Outlet, Big Salmon Lake	1,714
Mouth, Teslin River	1,654
Roaring Bull Rapids	1,707
Johnson's Crossing (Outlet, Teslin Lake)	1,756
Teslin	1,780
Mouth Nisutlin River	1,788
Mouth, Sidney Creek	1,837
Mouth, Hundred Mile Creek	1,851
Mouth, McNeil River	1,887
Outlet, Nisutlin Lake	1,892
Outlet, Lake Laberge	1,679
Inlet, Lake Laberge	1,712
Mouth, Takhini River	1,718
Whitehorse	1,745
Mouth, M'Clintock River	1,769
Outlet, Marsh Lake	1,764
Outlet, Little Atlin Lake	1,788
Outlet, Atlin Lake	1,812
Atlin	1,844
Tagish	1,786
Outlet, Tagish Lake	1,788
Carcross (Outlet Lake Bennett)	1,810
Bennett	1,835

Table 3. Yukon Area processors and associated data, 1986.

Commercial operation (Processing location/ buying station)	Product	District
Bristol Monarch 121 South River St. Seattle, WA 98108 (M/V Bristol Monarch, M/V Tamar, and M/V Arctic Sun)	Sac Roe Herring (frozen)	Cape Romanzof
Icicle Seafoods, Inc. 4019 21st Ave. W. Seattle, WA 98199 (M/V Marla Jo, M/V Arctic Star and M/V Bering Star)	Sac Roe Herring (frozen)	Cape Romanzof
J.X. Fisheries,Inc. 9420 Whitney Place, N.W. Seattle, WA 98117 (M/V Dritsik, M/V Lowboy, M/V Pankoff and M/V Alaska Packer)	Sac Roe Herring (frozen)	Cape Romanzof
Sea Roe Fisheries 3837 13th Ave. West #104 Seattle, WA 98119 (M/V Lafayette, M/V Pribilof, M/V Nowitna, M/V Bull Harbor, M/V Tracy D	Sac Roe Herring (frozen)	Cape Romanzof
Western Fisheries Producers, Inc. P.O. Box 1159 Pt. Roberts, WA 98281 (M/V Liberty, M/V Kona, M/V Cigale and M/V Shawn Aaron)	Sac Roe Herring (frozen)	Cape Romanzof
Yukon Delta Fish Marketing Co-op Inc. P.O. Box 128 Emmonak, AK 99581 (Emmonak)	Frozen Salmon Kings Cohos Chums Salmon Roe	1, 2 and 3
Amukon Trading Post Scammon Bay, AK 99662 (Black River)	Hard Salt Kings Chums Cohos	1
Bering Sea Fisheries,Inc. 4413 83rd Ave. S.E. Everett, WA 98205 (Lamont Slough)	Frozen Salmon Kings Cohos Chums Salmon Roe	1 and 2

Table 3. Yukon Area processors and associated data, 1986, (Continued).

Commercial operation (Processing location/ buying station)	Product	District
ANPAC, Inc. P.O. Box 92520 Anchorage, AK 99509 (Emmonak)	Fresh Salmon Kings Chums	1 and 2
Schenk Seafood Sales, Inc. P.O. Box 984 Bellingham, WA 98227 (Mountain Village)	Frozen Salmon Kings Cohos Chums Salmon Roe	1,2 and 3
Boreal Fisheries Box 561 Graham, WA 98338 (Old Andreafsky)	Fresh Salmon Kings Chums Cohos	1 and 2
Yupik Star Fisheries P.O. Box 168 Alakanuk, AK 99554 (Alakanuk)	Frozen Salmon Kings Chums Cohos Salmon Roe	1
Nakamura & Assoc., Inc. 811 First Ave., Suite 400 Colman Building Seattle, WA 98104 (Marshall)	Fresh Salmon Kings Chums Cohos Salmon Roe	2 and 3
Y-K Fisheries Box 213 McGrath, AK 99627 (St. Marys)	Fresh Salmon Kings Chums Cohos Salmon Roe	2
Fish Products Limited (Chet Clark) Box 19 Aniak, AK 99557 (Paimuit/Holy Cross)	Smoked Salmon Kings Salmon Roe	3
Walton Seafoods P.O. Box 258 McGrath, AK 99827 (Anvik)	Salmon Roe	4
Umphemour and Marshall International 878 Lynnwood Way North Pole, AK 99705 (North Pole)	Frozen Salmon Kings Chums Cohos Salmon Roe	6

Table 3. Yukon Area processors and associated data, 1986, (Continued).

Commercial operation (Processing location/ buying station)	Product	District
The Chase Company General Delivery Grayling, AK 99590 (Grayling)	Salmon Roe	4
Yutana Fisheries P.O. Box 82445 College, AK 99708 (Manley)	Frozen Salmon Kings Chums Coho	5 or 6
George Attla 2906 Whitman Rd. North Pole, AK 99705 (Yukon River Bridge)	Frozen Salmon Kings	5
Kyokko Suisan Alaska, Inc. 424 East Manor Anchorage, AK 99501 (Galena/Kaltag)	Frozen Salmon Chums Cohos Salmon Roe	4
Ludecker Fish Co. 2875 Ludecker Rd. Fairbanks, AK 99701	Frozen Salmon Kings Chums Cohos	6
Reinhard Rupprecht Box 51 Nenana, AK 99760 (Kallands)	Frozen Salmon Kings Chums Cohos	4
Stevens Fisheries Box 38 Nenana, AK 99760 (Nenana)	Frozen Salmon Kings Chums Cohos	6
T.J. Clark and Sons Rt. 2 Nenana, AK 99760 (Nenana)	Frozen Salmon Kings Chums Cohos Salmon Roe	6
Circle Fish Co. Box 14 Circle, AK 99733 (Circle)	Frozen Salmon Kings Chums	5
Yukon River Enterprises P.O. Box 3304 Palmer, AK 99645	Salmon Roe	4

Table 3. Yukon Area processors and associated data, 1986, (Continued).

Commercial operation (Processing location/ buying station)	Product	District
Eagle Seafoods Box 4085 Soldotna, AK 99669	Salmon Roe	4
Great Northern Seafoods 2604 Fairbands St. Suite B Anchorage, AK 99503	Salmon Roe	4
49th Star Seafood Co. 9001 Basher Dr. Anchorage, AK 99507	Frozen Salmon Chums Kings Salmon Roe	6
Keener Packing Co. S.R. 2 Box 738 Soldotna, AK 99669	Frozen Salmon Chums	5

Table 4. Yukon area commercial salmon and salmon roe sales by statistical area, 1986. 1/2/

Statistical Area	Summer Season 3/ Chinook	Summer Season 3/ Chum	Summer Season 3/ Chum Roe 5/	Fall Season 4/ Chinook	Fall Season 4/ Chum	Fall Season 4/ Chum Roe 6/	Fall Season 4/ Coho	Total Chinook	Total Chum	Total Chum Roe	Total Coho
334-11	4,180	39,468	0	7	376	0	83	4,187	39,844	0	83
12	7,937	102,887	0	17	9,891	0	1,974	7,954	112,778	0	1,974
13	3,494	35,315	0	0	3,032	0	805	3,494	38,347	0	805
14	5,429	52,980	0	1	2,683	0	383	5,430	55,663	0	383
15	10,252	26,732	0	6	21,058	0	7,056	10,258	47,790	0	7,056
16	1,415	6,807	0	7	4,091	0	6,525	1,422	10,898	0	6,525
17	15,944	85,798	0	4	12,004	0	5,722	15,948	97,802	0	5,722
18	4,342	31,140	0	0	6,217	0	2,276	4,342	37,357	0	2,276
Subtotal District 1	52,993	381,127	0	42	59,352	0	24,824	53,035	440,479	0	24,824
334-21	11,135	44,393	0	3	6,472	0	3,074	11,138	50,865	0	3,074
22	15,324	129,569	0	2	16,377	0	9,317	15,326	145,946	0	9,317
23	3,448	36,304	0	2	5,212	0	2,250	3,450	41,516	0	2,250
24	4,335	47,179	0	1	11,352	0	4,117	4,336	58,531	0	4,117
25	7,597	30,982	0	2	11,894	0	2,439	7,599	42,876	0	2,439
Subtotal District 2	41,839	288,427	0	10	51,307	0	21,197	41,849	339,734	0	21,197
334-31	606	442	0	0	2,793	0	793	606	3,235	0	793
32	295	0	0	0	0	0	0	295	0	0	0
Subtotal District 3	901	442	0	0	2,793	0	793	901	3,235	0	793
TOTAL LOWER YUKON	95,733	669,996	0	52	113,452	0	46,814	95,785	783,448	0	46,814
334-41	11	0	236,856	0	0	0	0	11	0	236,856	0
42	100	241	29,169	0	2,045	0	0	100	2,286	29,169	0
43	391	59	3,520	0	0	0	0	391	59	3,520	0
Subtotal District 4	502	300	269,545	0	2,045	0	0	502	2,345	269,545	0
334-51	0	0	0	0	1,332	0	0	0	1,332	0	0
52	1,552	682	0	0	11,907	395	0	1,552	12,589	395	0
53	875	8	0	0	7,471	0	0	875	7,479	0	0
54	306	0	0	0	1,343	0	0	306	1,343	0	0
Subtotal District 5	2,733	690	0	0	22,053	395	0	2,733	22,743	395	0
334-61	0	4,697	0	0	176	0	30	0	4,873	0	30
62	597	31,647	1,711	0	1,345	182	370	597	32,992	1,893	370
63	353	14,139	435	0	371	0	41	353	14,510	435	41
Subtotal District 6	950	50,483	2,146	0	1,892	182	441	950	52,375	2,328	441
TOTAL UPPER YUKON	4,185	51,473	271,691	0	25,990	577	441	4,185	77,463	272,268	441
GRAND TOTAL YUKON AREA	99,918	721,469	271,691	52	139,442	577	47,255	99,970	860,911	272,268	47,255

1/ Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
2/ Refer to Table 13 for estimates of total commercial harvest.

3/ Summer Season

District 1	6/14-7/15	District 4	6/22-8/01
District 2	6/15-7/14	District 5	6/27-7/19
District 3	6/26-7/07	District 6	7/04-8/13

4/ Fall Season

District 1	8/04-8/22	District 4	8/13-9/05
District 2	8/06-8/24	District 5	8/19-8/31
District 3	8/10-8/24	District 6	9/12-9/13

5/ May include small amounts of chinook salmon roe.
6/ May include small amounts of coho salmon roe.

Table 5. Yukon Area Commercial Fisheries Entry Commission salmon gear permits issued by residence, 1986.

District	Residence	Gillnet Permits	Fishwheel Permits
1,2 and 3	Emmonak	100	
	Mountain Village	96	
	Alakanuk	81	
	Kotlik	74	
	St. Marys	63	
	Pilot Station	48	
	Marshall	47	
	Scammon Bay	40	
	Sheldon Point	24	
	Anchorage	19	
	Bethel	16	
	Russian Mission	16	
	Fairbanks	13	
	Holy Cross	12	
	Stebbins	8	
	Unalakleet	8	
	Shaktoolik	4	
	Wasilla	4	
	Pitkas Point	3	
	Kotzebue	2	
	Sitka	2	
	Aniak	1	
	Big Lake	1	
	Chevak	1	
	Douglas	1	
	Eagle River	1	
	Eek	1	
	Elim	1	
	Fort Yukon	1	
	Hooper Bay	1	
	Iliamna	1	
	Kenai	1	
	Kodiak	1	
	Manley Hot Springs	1	
	Nome	1	
	Palmer	1	
	Salcha	1	
	Seward	1	
	St. Michael	1	
	Tok	1	
	Bellingham, WA	1	
	Everett, WA	1	
	Gig Harbor, WA	1	
	Redmond, WA	1	
	Rock Hill, SC	1	
	Seattle, WA	1	
	Troy, MT	1	
TOTAL LOWER YUKON		706 1/	
4,5 and 6	Anchor Point	0	1
	Anchorage	3	2
	Anvik	2	6
	Cantwell	0	1
	Circle	1	1
	College	0	1
	Fairbanks	15	21
	Fort Yukon	0	1
	Galena	6	20
	Grayling	3	6
	Holy Cross	2	0
	Kaltag	3	12
	Koyukuk	0	2
	McGrath	0	1
	Manley Hot Springs	3	4
	Minto	0	1
	Nenana	6	17
	North Pole	1	4
	Nulato	1	17
	Rampart	2	3
	Ruby	2	11
	Stevens Village	1	2
	Soldotna	1	0
	Tanana	7	15
	Wasilla	0	1
	Willow	1	0
TOTAL UPPER YUKON		60	150
GRAND TOTAL YUKON AREA		766	150

1/ Does not include transfers.

Table 6. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 1, Yukon area, 1986. 1/

Period No.	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
2	6/19-6/20	24	406	21,731	2.23	0	0.00	29,025	2.98	21,731	2.23	0	0.00	29,025	2.98
3	6/23-6/24	24	394	10,248	1.08	0	0.00	57,309	6.06	31,979	1.67	0	0.00	86,334	4.50
5	6/29-6/30	24	376	5,558	0.62	0	0.00	23,145	2.56	37,537	1.33	0	0.00	109,479	3.88
7	7/03-7/04	24	363	5,385	0.62	0	0.00	22,552	2.59	42,922	1.16	0	0.00	132,031	3.57
Subtotal 2/		96	431	42,922	1.16	0	0.00	132,031	3.57						
1	6/14	12	300	2,663	0.74	0	0.00	65,974	18.33	2,663	0.74	0	0.00	198,005	4.88
4	6/25-6/25	12	308	4,091	1.11	0	0.00	74,494	20.16	6,754	0.93	0	0.00	272,499	6.16
6	7/02	12	276	1,608	0.49	0	0.00	53,707	16.22	8,362	0.79	0	0.00	326,206	6.86
8	7/07-7/08	24	271	606	0.09	0	0.00	18,060	2.78	8,968	0.52	0	0.00	344,266	6.37
9	7/10-7/11	24	273	784	0.12	0	0.00	17,005	2.60	9,752	0.41	0	0.00	361,271	5.96
10	7/14-7/15	24	257	319	0.05	0	0.00	19,856	3.22	10,071	0.34	0	0.00	381,127	5.71
Subtotal 3/		204	441	10,071	0.34	0	0.00	381,127	5.71						
11	8/04-8/05	12/6	194	8	0.00	501	0.30	11,395	6.88	10,079	0.32	501	0.30	11,395	6.88
12	8/07-8/08	12/6	185	6	0.00	679	0.40	7,489	4.43	10,085	0.30	1,180	0.35	18,884	5.64
13	8/12	12/6	197	2	0.00	3,812	2.37	10,480	6.52	10,087	0.29	4,992	1.01	29,364	5.92
14	8/14-8/15	24/12	218	16	0.00	6,224	1.65	16,272	4.32	10,103	0.26	11,216	1.29	45,636	5.23
15	8/18-8/19	12/6	169	1	0.00	3,852	2.54	5,809	3.83	10,104	0.25	15,068	1.47	51,445	5.02
16	8/21-8/22	24/12	198	9	0.00	9,756	2.85	7,907	2.31	10,113	0.23	24,824	1.82	59,352	4.34
Subtotal 4/		96/48	282	10,113	0.23	24,824	1.82	59,352	4.34						
Season Total	300~~36~~/~~348~~252		444	53,035		24,824		440,479							

1/ Catches reported in numbers of fish sold in the round.
2/ Chinook salmon season, no mesh size restrictions.
3/ Summer chum salmon season (6/14 to 7/15). Six inch maximum mesh size restriction in effect during periods 1, 4, 6 and 8-10. Chinook salmon subtotal represents catch during restricted mesh size fishing periods.
4/ Fall chum salmon season (8/04 to 8/22). After 7/15 the district was divided into a Set Net Only (12 or 24 hour) area and a Gill Net (6 or 12 hour) area.

Table 7. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 2, Yukon area, 1986. 1/

Period No.	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
3	6/22-6/23	24	224	14,505	2.70	0	0.00	32,894	6.12	14,505	2.70	0	0.00	32,894	6.12
5	6/26-6/27	24	226	12,248	2.26	0	0.00	34,309	6.33	26,753	2.48	0	0.00	67,203	6.22
6	7/01-7/02	24	210	7,417	1.47	0	0.00	16,005	3.18	34,170	2.16	0	0.00	83,208	5.25
8	7/06-7/07	24	188	2,433	0.54	0	0.00	16,133	3.58	36,603	1.80	0	0.00	99,341	4.88
Subtotal 2/		96	235	36,603	1.80	0	0.00	99,341	4.88						
1	6/15	12	195	798	0.34	0	0.00	26,915	11.50	798	0.34	0	0.00	126,256	5.56
2	6/21	6	213	1,762	1.38	0	0.00	73,196	57.27	2,560	0.71	0	0.00	199,452	8.32
4	6/24	6	144	1,063	1.23	0	0.00	28,894	33.44	3,623	0.81	0	0.00	228,346	9.19
7	7/03-7/04	12	172	824	0.40	0	0.00	29,592	14.34	4,447	0.68	0	0.00	257,938	9.59
9	7/09-7/10	24	147	455	0.13	0	0.00	13,718	3.89	4,902	0.49	0	0.00	271,656	8.93
10	7/13-7/14	24	147	334	0.09	0	0.00	16,771	4.75	5,236	0.38	0	0.00	288,427	8.49
Subtotal 3/		180	239	5,236	0.38	0	0.00	288,427	8.49						
11	8/06	6	170	4	0.00	666	0.65	11,624	11.40	5,240	0.36	666	0.65	11,624	11.40
12	8/10	6	146	1	0.00	1,092	1.25	9,705	11.08	5,241	0.34	1,758	0.93	21,329	11.25
13	8/13	6	153	3	0.00	1,483	1.62	5,549	6.04	5,244	0.32	3,241	1.15	26,878	9.55
14	8/17	12	201	1	0.00	6,519	2.70	12,530	5.19	5,245	0.28	9,760	1.87	39,408	7.54
15	8/20	6	150	1	0.00	3,151	3.50	4,658	5.18	5,246	0.27	12,911	2.11	44,066	7.19
16	8/24	12	188	0	0.00	8,286	3.67	7,241	3.21	5,246	0.24	21,197	2.53	51,307	6.12
Subtotal 4/		48	231	5,246	0.24	21,197	2.53	51,307	6.12						
Season Total		324	259	41,849		21,197		339,734							

1/ Catches reported in numbers of fish sold in the round.
2/ Chinook salmon season, no mesh size restrictions.
3/ Summer chum salmon season (6/15 to 7/14). Six inch maximum mesh size restriction in effect during periods 1, 2, 4, 7 and 9-10. Chinook salmon subtotal represents catch during restricted mesh size fishing periods.
4/ Fall chum salmon season (8/06 to 8/24).

Table 8. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 3, Yukon area, 1986. 1/

Period No.	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
1	6/26-6/27	24	5	301	2.51	0	0.00	119	0.99	301	2.51	0	0.00	119	0.99
2	7/01-7/02	24	3	401	5.57	0	0.00	169	2.35	702	3.66	0	0.00	288	1.50
3	7/06-7/07	24	4	199	2.07	0	0.00	154	1.60	901	3.13	0	0.00	442	1.53
Subtotal 2/		72	7	901	3.13	0	0.00	442	1.53						
4	8/10	6	6	0	0.00	9	0.25	381	10.58	0	0.00	9	0.25	381	10.58
5	8/13	6	7	0	0.00	47	1.12	354	8.43	0	0.00	56	0.72	735	9.42
6	8/17	12	9	0	0.00	116	1.07	1,095	10.14	0	0.00	172	0.92	1,830	9.84
7	8/20	6	6	0	0.00	140	3.89	369	10.25	0	0.00	312	1.41	2,199	9.91
8	8/24	12	11	0	0.00	481	3.64	594	4.50	0	0.00	793	2.24	2,793	7.89
Subtotal 3/		42	14	0	0.00	793	2.24	2,793	7.89						
Season Total		114	18	901		793		3,235							

1/ Catches reported in numbers of fish sold in the round.
2/ Chinook salmon season, no mesh size restrictions.
3/ Fall chum salmon season (8/10 to 8/24).

Table 9. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 4, Yukon area, 1986. 1/

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe 2/	Coho
6/22-6/24	48	7	11	0	2,622	0
6/25-6/27	48	35	0	0	22,793	0
6/29-7/01	48	54	185	0	52,139	0
7/02-7/04	48	63	154	42	51,332	0
7/06-7/08	48	61	84	13	44,964	0
7/09-7/11	48	63	20	17	37,930	0
7/13-7/15	48	58	18	45	21,481	0
7/16-7/18	48	57	23	63	16,232	0
7/20-7/22	48	43	5	50	9,023	0
7/23-7/25	48	36	2	70	5,958	0
7/27-7/29	48	24	0	0	2,977	0
7/30-8/01	48	16	0	0	2,094	0
Subtotal 3/	576	75	502	300	269,545	0
8/13-8/15	48	1	0	325	0	0
8/17-8/19	48	1	0	420	0	0
8/20-8/22	48	1	0	720	0	0
8/24-8/26	48	1	0	240	0	0
8/27-8/29	48	1	0	340	0	0
8/31-9/02	48	0	0	0	0	0
9/03-9/05	48	0	0	0	0	0
Subtotal 4/	336	1	0	2,045	0	0
Total	912	75	502	2,345	269,545	0

1/ Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
2/ May include small amounts of chinook salmon roe.
3/ Chinook salmon season 6/22 to 8/01.
4/ Fall chum salmon season 8/13 to 9/05.

Table 10. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 5, Yukon area, 1986. 1/

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe 2/	Coho
6/27-6/29	48	2	24	0	0	0
7/01-7/03	48	8	205	0	0	0
7/04-7/06	48	12	967	92	0	0
7/08-7/10	48	16	887	590	0	0
7/11-7/12	24	11	360	8	0	0
7/13-7/19 3/	168	2	290	0	0	0
Subtotal 4/	384	21	2,733	690	0	0
8/19-8/20	24	12	0	3,377	0	0
8/21-8/22	36	15	0	6,212	0	0
8/24-8/25	24	13	0	5,810	395	0
8/30-8/31	24	13	0	6,654	0	0
Subtotal 5/	108	21	0	22,053	395	0
Total	492	30	2,733	22,743	395	0

1/ Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
2/ May include small amounts of coho salmon roe.
3/ Subdistrict 5-D only, subdistricts 5-A, 5-B, and 5-C closed on 7/12.
4/ Chinook salmon season 6/27 to 7/19.
5/ Fall chum salmon season 8/19 to 8/31.

Table 11. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 6, Yukon area, 1986. 1/

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe 2/	Coho
7/04-7/06	48	2	8	0	0	0
7/07-7/09	48	4	73	24	0	0
7/11-7/13	48	7	485	1,179	0	0
7/14-7/16	48	11	308	4,998	330	0
7/25-7/27	48	14	43	9,653	665	0
7/28-7/30	48	17	31	13,032	0	0
8/01-8/03	48	17	0	9,146	1,151	0
8/04-8/06	48	14	0	6,416	0	0
8/08-8/10	48	4	0	2,560	0	0
8/11-8/13	48	4	2	3,475	0	0
Subtotal 3/	480	16	950	50,483	2,146	0
9/12-9/13	12	16	0	1,892	182	441
Subtotal 4/	12	16	0	1,892	182	441
Total	492	27	950	52,375	2,328	441

1/ Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
2/ May include small amounts of chinook and coho salmon roe.
3/ Chinook salmon season 7/04 to 7/16, summer chum salmon season 7/25 to 8/13.
4/ Fall chum salmon season 9/12 to 9/13.

Table 12. Commercial salmon and salmon roe sales by gear type and by statistical area, upper Yukon districts, 1986.[1/2/]

Statis. Area	Summer Season									Fall Season								
	Chinook			Chum			Summer Chum Roe[3/]			Fall Chum			Fall Chum Roe[4/]			Coho		
	GN	FW	Sub-total	GN	FW	Sub-total	GN	FW	Sub-total	GN	FW	Sub-total	GN	FW	Sub-total	GN	FW	Sub-total
334-41	11	0	11	0	0	0	30,926	205,930	236,856	0	0	0	0	0	0	0	0	0
334-42	99	1	100	216	25	241	185	28,984	29,169	2,045	0	2,045	0	0	0	0	0	0
334-43	94	297	391	19	40	59	0	3,520	3,520	0	0	0	0	0	0	0	0	0
Subtotal Dist. 4	204	298	502	235	65	300	31,111	238,434	269,545	2,045	0	2,045	0	0	0	0	0	0
334-51	0	0	0	0	0	0	0	0	0	0	1,332	1,332	0	0	0	0	0	0
334-52	642	910	1,552	86	596	682	0	0	0	864	11,043	11,907	78	317	395	0	0	0
334-53	548	327	875	8	0	8	0	0	0	954	6,517	7,471	0	0	0	0	0	0
334-54	228	78	306	0	0	0	0	0	0	0	1,343	1,343	0	0	0	0	0	0
Subtotal Dist. 5	1,418	1,315	2,733	94	596	690	0	0	0	1,818	20,235	22,053	78	317	395	0	0	0
334-61	0	0	0	2,359	2,338	4,697	0	0	0	0	176	176	0	0	0	0	30	30
334-62	63	534	597	1,773	29,874	31,647	0	1,711	1,711	76	1,269	1,345	0	182	182	24	346	370
334-63	21	332	353	1,096	13,043	14,139	0	435	435	0	370	370	0	0	0	0	41	41
Subtotal Dist. 6	84	866	950	5,228	45,255	50,483	0	2,146	2,146	76	1,816	1,892	0	182	182	24	417	441
Totals Upper Yukon	1,706	2,479	4,185	5,557	45,916	51,473	31,111	240,580	271,691	3,939	22,051	25,990	78	499	577	24	417	441

1/ Roe sales expressed in pounds of unprocessed product.
2/ Gear codes: GN set-gillnet; FW fishwheel.
3/ May include small amounts of chinook salmon roe.
4/ May include small amounts of coho salmon roe.

Table 13. Yukon River drainage total estimated commercial related salmon catch by district and country, 1986.

District	Chinook	Summer Chum			Fall Chum			Coho
		Round	Roe 1/	Other 2/ Total 3/	Round	Roe 1/	Total 4/	
1	53,035	381,127	0	0 381,127	59,352	0	59,352	24,824
2	41,849	288,427	0	0 288,427	51,307	0	51,307	21,197
3	901	442	0	0 442	2,793	0	2,793	793
TOTAL LOWER YUKON	95,785	669,996	0	0 669,996	113,452	0	113,452	46,814
4	502	300	269,545	195,690 5/ 465,535 6/	2,045	0	2,045	0
5	2,733	690	0	0 690	22,053	395	22,448	0
6	950	50,483	2,146	0 52,629	1,892	182	2,074	441
TOTAL UPPER YUKON	4,185	51,473	271,691	195,690 518,854	25,990	577	26,567	441
TOTAL ALASKAN	99,970	721,469	271,691	195,690 1,188,850	139,442	577	140,019	47,255
TOTAL CANADIAN	10,797	0	0	0 0	11,464	0	11,464	0
GRAND TOTAL	110,767	721,469	271,691	195,690 1,188,850	150,906	577	151,483	47,255

1/ One pound of roe is equivalent to one female chum.
2/ Other refers to estimated number of males taken incidentally during roe fishery which were not sold.
3/ Totals may not be the same as those in Table 15, since many females stripped of roe and incidental males are reported as subsistence catches.
4/ Totals may not be the same as those in Table 15, since females stripped of roe are believed to be reported as subsistence.
5/ Calculated by dividing pounds of roe by average proportion of females captured at Stink Creek test fishery from 1981-1985 (.579), subtracted by pounds of roe and fish sold in the round (assumed to be all males).
6/ It is estimated that 99,632 of these were reported as subsistence.

Table 14. Yukon River drainage subsistence salmon catch data, 1986. 1/

Village	Survey Date	Fishing Families	Dogs 2/	Chinook	Summer Chum	Fall Chum	Coho	Whitefish/ Sheefish	8" Nets	6" Nets	Fish Wheels
Sheldon's Pt.	8/28	15	59	592	4,755	259	237	662/916	10	17	0
Alakanuk	8/23-27	67	189	1,027	11,280	2,030	1,518	1,539/1,158	27	96	0
Emmonak	8/30	75	103	1,754	12,618	2,746	732	1,161/838	30	50	0
Kotlik	8/24-26	49	170	1,902	10,201	3,965	238	160/407	19	49	0
Y-1 Subtotal		206	521	5,275	38,854	9,000	2,725	3,522/3,319	86	212	0
Mt. Village	9/4	78	219	1,367	11,468	2,947	828	1,452/697	40	78	0
Pitkas Pt.	9/6	11	77	274	1,973	156	71	239/160	7	11	0
St. Marys	8/31-9/5	60	379	1,443	13,013	5,245	4,761	962/243	36	64	0
Pilot Station	9/1	45	117	1,452	7,870	1,663	1,514	3,857/2,171	23	47	0
Marshall	9/2	55	379	1,947	7,172	3,472	1,966	3,633/721	31	43	0
Y-2 Subtotal		249	1,171	6,483	41,496	13,483	9,140	10,143/3,992	137	243	0
Russian Mission	9/3	23	108	1,747	3,136	637	679	268/180	21	23	0
Holy Cross	9/5	27	66	2,505	2,392	1,148	102	279/127	27	13	0
Y-3 Subtotal		50	174	4,252	5,528	1,785	781	547/307	48	36	0
Lower Yukon Total		505	1,866	16,010	85,878	24,268	12,646	14,212/7,618	271	491	0
Anvik	Mail	15	92	959	41,581	913	296	181/352	16	10	7
Shageluk 3/	10/15	11	104	53	6,710	370	173	308/88	1	11	0
Grayling	10/15	23	183	1,837	35,284	4,204	860	1,039/425	19	20	10
Kaltag	8/6,10/20	21	163	1,080	24,667	2,024	229	610/49	17	9	13
Nulato	8/7,10/21	28	128	1,835	10,349	1,762	69	419/93	19	16	15
Koyukuk	10/23	15	49	569	6,250	2,195	154	349/87	8	13	1
Galena	Aug,Oct	25	139	1,046	6,618	4,819	465	3,275/325	20	10	6
Ruby	8/8,10/24	19	220	1,263	7,883	7,101	339	900/190	2	8	11
Y-4 Subtotal		157	1,078	8,642	139,342 4/	23,388	2,585	7,081/1,609	102	97	63
Tanana	Aug,Oct	34	686	1,672	11,646	32,049	4,691	9,960/3,230	20	15	31
Rampart	8/15,11/3	6	68	1,700	1,450	3,950	110	100/60	7	2	2
Fbks. f.c. 5/,6/	Mail	48	90	1,762	1,382	11,708	709	361/146	50	27	10
Stevens V	8/15,11/3	17	106	2,839	3,116	4,150	67	408/71	20	9	6
Beaver	8/15,11/3	8	54	708	0	3,321	124	100/55	7	1	1
Ft. Yukon	11/5,6,7	31	216	3,083	3,264	8,543	118	2,899/566	24	15	18
Circle/Central	8/20,11/3	16	97	2,2[illegible]33	[illegible]459	3,6[illegible]50	37	80/14	11	12	10
Eagle 7/	Sept,Nov	[illegible]41	230	1,9[illegible]15	[illegible]516	16,0[illegible]27	6	848/159	34	36	7
Y-5 Subtotal		20[illegible]1	1,547	15,9[illegible]12	21,8[illegible]33	83,39[illegible]8	5,862	14,756/4,301	173	117	85
Main River Totals		86[illegible]3	4,491	40,[illegible]544	247,[illegible]053	131,0[illegible]54	21,093	36,049/13,528	546	705	148

Changes via Brannian & Gamath 1987 Subsis. Rept.

Table 14. Yukon River drainage subsistence catch data, 1986 1/. -Continued-

Village	Survey Date	Fishing Families	Dogs 2/	Chinook	Summer Chum	Fall Chum	Coho	Whitefish/ Sheefish	8" Nets	6" Nets	Fish Wheels
Manley	8/13,Oct	11	127	621	604	5,90[illegible]5	538	593/85	8	5	7
Minto	8/29,Oct	11	72	350	1,587	545	1,058	0/1	7	6	2
Nenana	8/21,Mail	23	324	2,093	10,827	15,902	10,090	433/226	12	14	17
Fbks. 8/,9/,10/	Mail	211	0	637	4,0[illegible]24	2,80[illegible]3	1,63[illegible]5	61/12	44	195	26
Y-6 Subtotal		256	523	3,701	17,04[illegible]2	25,15[illegible]5	13,32[illegible]1	1,[illegible]/3[illegible]4	71	220	52
Huslia	10/22	16	150	82	10,516	808	31	1,565/149	4	17	1
Hughes	10/22	14	78	296	7,280	1,422	0	309/162	1	14	0
Allakaket 11/	10/22	21	191	563	8,934	878	15	1,641/398	10	27	0
Koyukuk R. Subtotal		51	427	941	26,730	3,108	46	3,515/709	15	58	1
Venetie	8/20,11/5	8	87	32	0	3,193	0	0/0	0	8	0
Chalkyitsik	11/5	7	11	0	0	1,533	8	1,473/440	0	7	0
Subt Chandalar/Black R		15	98	32	0	4,726	8	1,473/440	0	15	0
Subtotal Upper Yukon (Alaska)		68[illegible]	3,673	29,2[illegible]	20[illegible],[illegible]	139,7[illegible]	21,82[illegible]	27,9[illegible]/7,3[illegible]	361	507	201
Totals Yukon River drainage (Alaska)		1,18[illegible]5	5,539	45,2[illegible]	290,8[illegible]	164,0[illegible]	34,4[illegible]	42,1[illegible]/15,0[illegible]1	632	998	201
Old Crow 12/		13/	13/	300	13/	700	300	13/	13/	13/	13/
Yukon Territory 12/ Totals		13/	13/	9,267	13/	3,072	300	13/	13/	13/	13/
Grand Total Yukon River drainage		1,18[illegible]5	5,539	54,5[illegible]05	290,8[illegible]25	167,1[illegible]15	34,7[illegible]68	42,1[illegible]24/15,[illegible]001	632	998	201

1/ Catch data expanded.
2/ Data from fishing families only.
3/ Shageluk harvest data from households fishing in main-stem Yukon River and Innoko River.
4/ An estimated 33,000 of these fish were taken for subsistence purposes (either by subsistence only fishermen or by commercial fishermen before or after the close of the commercial fishing season).
5/ Data from fishermen who fished between Hess Creek and Dall River.
6/ 76 permits issued, 12 did not fish, 14 of the 17 not reporting catches were expanded for; catches by Stevens Village residents shown under Stevens Village.
7/ Tok catches (three fishermen) added to Eagle in 1986.
8/ Data from fishermen who fished on the Tanana River between the mouth of Wood River and the mouth of Salcha River.
9/ Fairbanks, North Pole, and Salcha data combined.
10/ 323 permits issued, 102 did not fish, 18 of the 28 not reporting catches were expanded for.
11/ [illegible]tna combined with Allakaket.
12/ [illegible]a from Department of Fisheries & Oceans, Whiteh[illegible] YT.
13/ [illegible]a not collected.

Table 15. Yukon River drainage total utilization of salmon by district and country, 1986.

Note changes in Table 4 Subsis. Catches.

District	Fishery	Chinook	Summer Chum	Fall Chum	Coho
1	Comm.	53,035	381,127	59,352	24,824
	Subs.	5,275	38,854	9,000	2,725
	Total	58,310	419,981	68,352	27,549
2	Comm.	41,849	288,427	51,307	21,197
	Subs.	6,483	41,496	13,483	9,140
	Total	48,332	329,923	64,790	30,337
3	Comm.	901	442	2,793	793
	Subs.	4,252	5,528	1,785	781
	Total	5,153	5,970	4,578	1,574
TOTAL LOWER YUKON	Comm.	95,785	669,996	113,452	46,814
	Subs.	16,010	85,878	24,268	12,646
	Total	111,795	755,874	137,720	59,460
4	Comm.	502	359,193 1/	2,045	0
	Subs. 2/	9,583	166,072	26,496	2,631
	Total	10,085	525,265	28,541	2,631
5	Comm.	2,733	690	22,053 4/	0
	Subs. 3/	15,988	21,889	88,117	5,870
	Total	18,721	22,579	110,170	5,870
6	Comm.	950	50,483 4/	1,892 4/	441
	Subs.	3,701	17,049	25,153	13,323
	Total	4,651	67,532	27,045	13,764
TOTAL UPPER YUKON	Comm.	4,185	410,366	25,990	441
	Subs.	29,272	205,010	139,766	21,824
	Total	33,457	615,376	165,756	22,265
TOTAL YUKON AREA (ALASKA)	Comm.	99,970	1,080,362	139,442	47,255
	Subs.	45,282	290,888	164,034	34,470
	Total	145,252	1,371,250	303,476	81,725
TOTAL CANADA 5/	Comm.	10,797	0	11,464	0
	Subs. 6/	9,267	0	3,072	300
	Total	20,064	0	14,536	300
GRAND TOTAL	Comm.	110,767	1,080,362	150,906	47,255
	Subs.	54,549	290,888	167,106	34,770
	Total	165,316	1,371,250	318,012	82,025

1/ Total estimated commercial related harvest was 465,535 summer chum salmon (Table 13) of which 106,342 fish were reported as subsistence.
2/ Includes Innoko and Koyukuk River drainages.
3/ Includes Chandalar and Black River drainages.
4/ Harvest of females for commercial roe sales believed to be reported as subsistence.
5/ Data from Department of Fisheries and Oceans, Whitehorse, YT.
6/ Combined Indian Food and Domestic fisheries.

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1986. a

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho	Pinks
Andreafsky River							
East Fork (Tower Count)	6/25-7/14		(1,530) b	167,614 c	--	--	124,618 b
East Fork (Aerial)	7/14	Fair	1,954	(83,931)	--	--	(2,230)
West Fork (Aerial)	7/14	Good	3,158	99,373	--	--	--
	Subtotal		5,112	266,987	--	--	124,618
Yukon River (Pilot Station)							
Main River Sonar d	6/9-9/12		(86,449)	(1,943,558)	(526,814)	(199,798)	(1,055,746)
Anvik River							
Aerial Counts							
Mainstem River	7/28	Good	1,027	--	--	--	--
McDonald Creek	7/28	Good	8	--	--	--	--
Otter Creek	7/28	Good	43	--	--	--	--
Yellow River	7/28	Good	40	--	--	--	--
Sonar Count e	6/21-7/15		--	1,189,602	--	--	no est
	Subtotal		1,118	1,189,602	--	--	--
Nulato River							
Below Forks	7/12,22	Fair	27	5,295	--	--	--
South Fork	7/12,22	Fair	1,522	16,848	--	--	--
North Fork	7/12,22	Fair	1,425	42,122	--	--	--
	Subtotal		2,974	64,265	--	--	--
Koyukuk River Drainage							
Gisasa River	7/12,22	Fair-Good	1,346	12,114	--	--	--
Henshaw Creek	7/28	Fair	561	2,475	--	--	--
South Fork Koyukuk River	7/28,29	Good-Fair	556	1,576	--	--	--
Jim River	7/28,29	Good-Fair	238	869	--	--	--
	Subtotal		794	2,445	--	--	--
Middle Fork Koyukuk River	7/29	Fair	49	--	--	--	--
Bettles River	7/29	Good	--	5	--	--	--
	Subtotal		49	5	--	--	--
Total Koyukuk River Drainage			2,750	17,039	--	--	--

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1986. a (continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho	Pinks
Melozitna River							
Fox Creek	7/12	Fair	--	90	--	--	--
Melozi Hot Springs Creek	7/22	Fair	5	2,958	--	--	--
	Subtotal		5	3,048	--	--	--
Tozitna River	7/28	Good	222	1,778	--	--	--
Lower Tanana River Drainage							
Kantishna River Drainage							
Toklat River							
Barton Creek	7/27,10/17	Poor,Fair	5	--	50	496	--
Geiger Creek f	10/16	Fair	--	--	1,287	5	--
Sushana River	10/17	Good	--	--	711	2	--
Toklat Ri (vic Rdhse)	9/29	Good	--	--	10,710	0	--
	Subtotal		5	--	12,758	503	--
Bearpaw River (mainstem)	10/29	Fair	--	--	0	--	--
Moose Creek	10/29	Fair	--	--	205	23	--
	Subtotal		--	--	205	23	--
Nenana River Drainage							
Lost Slough	10/29	Fair	--	--	--	794	--
Seventeen Mile Slough g,h	8/2,10/29	Good,Poor	306	72	--	218	--
Julius Creek							
Clear Creek weir count	7/6-8/5		168 i	79	--	--	--
(aerial survey)	7/27	Fair-Poor	(47)	--	--	--	--
(boat/foot survey) g	10/8		--	--	1	605	--
Foster Creek f,g	10/8		--	--	1	30	--
Wood Creek weir count g	9/7-10/24		--	--	(560) j	1,664 k	--
	Subtotal		474	151	2	3,311	--
Chatanika River	8/9	Fair	79	190	--	--	--
Chena River	8/4	Fair	2,031 l	1,509	--	--	--
Population Estimate m			(13,398) u	--	--	--	--
	Subtotal		2,031	1,509	--	--	--

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1986. a (continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho	Pinks
Salcha River	8/4	Good	3,368	8,028	--	--	--
Total Lower Tanana River			5,957	9,878	12,965	3,837	--
Upper Tanana River Drainage							
Bear Creek	8/11	Fair	6	--	--	--	--
Benchmark #735 Slough (vic)	10/30	Fair	--	--	33	--	--
Slough in vic Little Delta R.	10/30	Fair	--	--	189	--	--
Slough in vic Delta Creek	10/30	Fair	--	--	15	--	--
Richardson Clearwater River	10/30	Poor	--	--	--	146	--
Vicinity of Andersen Slough	10/30	Fair	--	--	70	--	--
Delta River							
Aerial Counts	10/30	Good	--	--	(5,967)	--	--
Ground Counts	11/12	Fair	--	--	(5,785)	0	--
Population Estimate n	9/30-11/26		--	--	6,703	--	--
South Bank Tanana River	10/30	Poor	--	--	1,610	--	--
Bluff Cabin Slough f	11/4	Good	--	--	3,458	9	--
Bluff Cabin Spring f	10/17	Good	--	--	--	291	--
Clearwater Lake Outlet Slough	10/17	Good	--	--	475	--	--
Clearwater Lake and Outlet	10/17	Good	--	--	--	3,577	--
Delta Clearwater River h,o	11/20-21	Fair-Good	--	--	--	10,857	--
Onemile Slough	10/17	Good	--	--	1,949	300	--
Tanana slough adj to Onemile Sl	10/30	Fair	--	--	148	--	--
Tanana just upstr of Onemile Sl	10/17	Good	--	--	853	--	--
Tanana slough vic Gerstle R.	10/30	Fair	--	--	108	--	--
Billy Creek Slough	10/30	Fair	--	--	556	--	--
Total Upper Tanana River			6	--	16,167	15,180	--
Total Tanana River			5,963	9,878	29,132	19,017	--
Bear Creek f	7/11		--	56	--	--	--
Chandalar River							
Sonar Estimate e,p	8/9-9/27		--	--	59,313	--	--
Mainstem (aerial)	7/29,10/7	Poor,Poor	19	--	(4,035)	--	--
Subtotal			19	--	59,313	--	--

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1986. a (continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho	Pinks
Porcupine River Drainage							
Sheenjek River (aerial)	10/2	Poor	--	--	(12,659)	--	--
Sonar Counts e	8/17-9/24		--	--	83,197	--	--
	Subtotal		--	--	83,197	--	--
Fishing Branch River (weir) q	9/1-10/9		--	--	31,173	--	--
Aerial q	10/4		--	--	(7,836)	--	--
	Subtotal		--	--	31,173	--	--
Total Porcupine River			--	__	114,370	--	--
Yukon Territory Streams							
Fortymile River q,r	9/12-18		1	7	--	--	--
Klondike River q	8/11	Poor	10	--	--	--	--
Stewart River							
McQuesten River q	8/17	Fair	0	--	--	--	--
White River q	10/27		--	--	0	--	--
Donjek River							
Kluane River q	10/27	Good	--	--	16,686	--	--
Tincup Creek q	8/20	Good	220	--	--	--	--
Koidern River q	10/27	Good	--	--	14	--	--
	Subtotal		220	--	16,700	--	--
Pelly River							
Blind Creek q,s	8/?		25	--	--	--	--
Ross River q	8/18	Fair	72	--	--	--	--
Prevost River q	8/18	Fair	0	--	--	--	--
	Subtotal		97	--	--	--	--
Tatchun Creek f,q	8/23	Good	155	--	--	--	--
Little Salmon River q	8/27	Poor	54	--	--	--	--

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1986. a (continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho	Pinks
Big Salmon River							
Weir Count q	8/1-9/3		1,816	--	--	--	--
ADFG Peak Aerial Counts							
(upstr of Souch Cr)	8/21	Fair-Poor	(745)	--	--	--	--
	Subtotal		1,816	--	--	--	--
Teslin River (mainstem) q	10/28	Fair	--	--	200	--	--
Nisutlin River	8/21	Good-Poor	703	--	--	--	--
Wolf River	8/21	Fair-Poor	271	--	--	--	--
	Subtotal		974	--	200	--	--
Takhini River q	8/29	Fair	216	--	--	--	--
Whitehorse Fishway Counts q	7/7-8/30		557 t	--	--	--	--
Mainstem Yukon River							
Vic Ft Selkirk to Carmacks q	10/7		1	--	825	--	--
Population Estimate m,q			(36,479)	--	(101,826)	--	--
	Subtotal		1	--	825	--	--
Yukon River Drainage Totals			22,264	1,552,660	220,540	19,017	124,618

a Only peak estimates listed; carcass counts included. Data in parentheses not included in totals or subtotals.
b This is an incomplete estimate as tower project ended early.
c This is an expanded season population estimate based upon the tower count and historic timing pattern.
d Biosonics Sonar.
e Bendix Side Scan Sonar.
f Foot survey.
g F.R.E.D. Division estimate.
h Boat survey.
i Includes 60 chinook used in a F.R.E.D. Division egg-take.
j None allowed to spawn wild.
k Includes 383 coho used in a F.R.E.D. Division egg-take.
l An additional 257 chinook carcasses were removed from river prior to this survey.
m Population estimate based upon mark and recapture study.
n Population estimate based upon replicate foot surveys.
o Sport Fish Division estimate.
p U.S. Fish and Wildlife Service (USFWS) estimate.
q Canada Department of Fisheries and Oceans (DFO) estimate.
r Test netting results.
s Periodic spot checks.
t Includes 150 chinook taken for hatchery brood stock of which 90 died prior to egg-take.
u Preliminary estimate.

Table 17. Yukon River (Alaska) salmon escapement objectives for selected species and streams.

Stream	Escapement Objective a			Escapement Objective a			Escapement Objective a	
	Species	Minimum	Optimum	Species	Minimum	Optimum	Species	Minimum Optimum
Andreafsky River								
East Fork	Chinook	1,100	1,600	Summer Chum	76,000	109,000	--	
West Fork	Chinook	700	1,000	Summer Chum	62,000	116,000	--	
Anvik River								
Mainstem								
Yellow River to McDonald Cr	Chinook	300	500	--			--	
Goblet Cr to McDonald Cr	--			Summer Chum	209,000	356,000 b	--	
Nulato River								
North Fork	Chinook		500	Summer Chum	37,000	53,000	--	
South Fork	Chinook		500	--			--	
Hogatza River								
Clear Creek	--			Summer Chum	5,000	8,000	--	
Caribou Creek	--			Summer Chum	5,000	9,000	--	
Gisasa River	Chinook		650	--			--	
Chena River								
Mainstem from Flood Control Dam to Middle Fork	Chinook	1,000	1,700	--			--	
Salcha River	Chinook	1,500	3,500	--			--	
Sheenjek River	--			--			Fall Chum	62,000 c
Toklat River	--			--			Fall Chum	33,000 c
Delta River	--			--			Fall Chum	11,000 c

a Escapement objectives in numbers of fish are preliminary and are subject to change as additional data becomes available. Unless otherwise indicated, escapement objectives are based on aerial survey index estimates which do not represent total escapement, but do reflect annual spawner abundance trends when using standard survey methods under acceptable survey conditions.

b Optimum number calculated from escapement-return relationships.

c Total season escapement objective (expanded from inseason point estimates).

Table 18. Commercial herring catch and effort data by fishing period, Cape Romanzof District, 1986.

Date	Hours Fished	No. of Fishermen	Daily Catch			
			Bait	Sac Roe	Total	Roe %
29-May	12	46	18.3	171.4	189.7	8.73
30-May	12	82	11.6	616.6	628.2	9.38
31-May	18	94	16.2	1030.7	1046.9	9.11
Total	42	97	46.1	1818.7	1864.8	9.17

Appendix Table 1. Alaskan and Canadian total utilization of Yukon River salmon, 1903-1986. a

	Alaska			Canada			Total		
Year	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total
1903						4,666			4,666
1904									
1905									
1906									
1907									
1908						7,000			7,000
1909						9,238			9,238
1910									
1911									
1912									
1913						12,133			12,133
1914						12,573			12,573
1915						10,466			10,466
1916						9,566			9,566
1917									
1918	12,239	1,500,065	1,512,304			7,066	12,239	1,500,065	1,519,370
1919	104,822	738,790	843,612			1,800	104,822	738,790	845,412
1920	78,467	1,015,655	1,094,122			12,000	78,467	1,015,655	1,106,122
1921	69,646	112,098	181,744			10,840	69,646	112,098	192,584
1922	31,825	330,000	361,825			2,420	31,825	330,000	364,245
1923	30,893	435,000	465,893			1,833	30,893	435,000	467,726
1924	27,375	1,130,000	1,157,375			4,560	27,375	1,130,000	1,161,935
1925	15,000	259,000	274,000			3,900	15,000	259,000	277,900
1926	20,500	555,000	575,500			4,373	20,500	555,000	579,873
1927		520,000	520,000			5,366		520,000	525,366
1928		670,000	670,000			5,733		670,000	675,733
1929		537,000	537,000			5,226		537,000	542,226
1930		633,000	633,000			3,660		633,000	636,660
1931	26,693	565,000	591,693			3,473	26,693	565,000	595,166
1932	27,899	1,092,000	1,119,899			4,200	27,899	1,092,000	1,124,099
1933	28,779	603,000	631,779			3,333	28,779	603,000	635,112
1934	23,365	474,000	497,365			2,000	23,365	474,000	499,365
1935	27,665	537,000	564,665			3,466	27,665	537,000	568,131
1936	43,713	560,000	603,713			3,400	43,713	560,000	607,113
1937	12,154	346,000	358,154			3,746	12,154	346,000	361,900
1938	32,971	340,450	373,421			860	32,971	340,450	374,281
1939	28,037	327,650	355,687			720	28,037	327,650	356,407
1940	32,453	1,029,000	1,061,453			1,153	32,453	1,029,000	1,062,606
1941	47,608	438,000	485,608			2,806	47,608	438,000	488,414
1942	22,487	197,000	219,487			713	22,487	197,000	220,200
1943	27,650	200,000	227,650			609	27,650	200,000	228,259
1944	14,232		14,232			986	14,232		15,218
1945	19,727		19,727			1,333	19,727		21,060
1946	22,782		22,782			353	22,782		23,135
1947	54,026		54,026			120	54,026		54,146
1948	33,842		33,842				33,842		33,842
1949	36,379		36,379				36,379		36,379
1950	41,808		41,808				41,808		41,808
1951	56,278		56,278				56,278		56,278
1952	38,637	10,868	49,505				38,637	10,868	49,505
1953	58,859	385,977	444,836				58,859	385,977	444,836
1954	64,545	14,375	78,920				64,545	14,375	78,920
1955	55,925		55,925				55,925		55,925
1956	62,208	10,743	72,951				62,208	10,743	72,951
1957	63,623		63,623				63,623		63,623
1958	75,625	337,500	413,125	11,000	1,500	12,500	86,625	339,000	425,625
1959	78,370		78,370	8,434	3,098	11,532	86,804	3,098	89,902
1960	67,597		67,597	9,653	15,608	25,261	77,250	15,608	92,858
1961	141,152	452,521	593,673	13,246	9,076	22,322	154,398	461,597	615,995
1962	105,844	425,277	531,121	13,937	9,436	23,373	119,781	434,713	554,494
1963	141,910	401,700	543,610	10,077	27,696	37,773	151,987	429,396	581,383
1964	109,818	492,233	602,051	7,408	12,187	19,595	117,226	504,420	621,646
1965	134,706	472,798	607,504	5,380	11,789	17,169	140,086	484,587	624,673
1966	104,887	296,310	401,197	4,452	13,192	17,644	109,339	309,502	418,841
1967	146,104	335,436	481,540	5,150	16,961	22,111	151,254	352,397	503,651
1968	118,632	259,185	377,817	5,042	11,633	16,675	123,674	270,818	394,492
1969	105,027	416,623	521,650	2,624	7,776	10,400	107,651	424,399	532,050
1970	93,019	582,049	675,068	4,663	3,711	8,374	97,682	585,760	683,442
1971	136,191	530,537	666,728	6,447	16,911	23,358	142,638	547,448	690,086
1972	113,098	454,085	567,183	5,729	7,532	13,261	118,827	461,617	580,444
1973	99,670	769,023	868,693	4,522	10,135	14,657	104,192	779,158	883,350
1974	118,053	1,218,032	1,336,085	5,631	11,646	17,277	123,684	1,229,678	1,353,362
1975	76,883	1,286,437	1,363,320	6,000	20,600	26,600	82,883	1,307,037	1,389,920
1976	105,582	1,021,708	1,127,290	5,025	5,200	10,225	110,607	1,026,908	1,137,515
1977	114,338	1,090,330	1,204,668	7,527	12,479	20,006	121,865	1,102,809	1,224,674
1978	129,465	1,650,942	1,780,407	5,881	9,566	15,447	135,346	1,660,508	1,795,854
1979	158,678	1,654,445	1,813,123	10,375	22,084	32,459	169,053	1,676,529	1,845,582
1980	196,709	1,840,123	2,036,832	22,546	22,218	44,764	219,255	1,862,341	2,081,596
1981	187,708	2,115,459	2,303,167	17,809	22,281	40,090	205,517	2,137,740	2,343,257
1982	151,802	1,306,171	1,457,973	16,908	16,091	32,999	168,710	1,322,262	1,490,972
1983	197,388	1,673,071	1,870,459	18,652	29,490	48,142	216,040	1,702,561	1,918,601
1984	162,232	1,502,911	1,665,143	16,495	29,267	45,762	178,727	1,532,178	1,710,905
1985	185,959	1,597,127	1,783,086	19,001	41,515	60,516	204,960	1,638,642	1,843,602
1986	145,252	1,669,826	1,815,078	20,064	14,836	34,900	165,316	1,684,662	1,849,978

a Commercial and subsistence harvest combined in numbers of fish, including "equivalent fish" converted from roe sales. See ADF&G 1985 Yukon Area Annual Management Report for data sources and methods of catch estimation used for some years.

Appendix Table 2. Commercial chinook salmon sales by district and country, Yukon River drainage, 1961-1986. 1/

	Lower Yukon Area				Upper Yukon Area						
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Alaska Total	Canada Total	Grand Total
1961	84,466	29,026	4,368	117,860	-	-	-	1,804	119,664	3,446	123,110
1962	67,099	22,224	4,687	94,010	-	-	-	724	94,734	4,037	98,771
1963	85,004	24,221	7,020	116,245	-	-	-	803	117,048	2,283	119,331
1964	67,555	20,246	4,705	92,506	-	-	-	1,081	93,587	3,208	96,795
1965	89,268	23,763	3,204	116,235	-	-	-	1,863	118,098	2,265	120,363
1966	70,788	16,927	3,612	91,327	-	-	-	1,988	93,315	1,942	95,257
1967	104,350	20,239	3,618	128,207	-	-	-	1,449	129,656	2,187	131,843
1968	79,465	21,392	4,543	105,400	-	-	-	1,126	106,526	2,212	108,738
1969	71,688	14,756	3,595	90,039	-	-	-	988	91,027	1,640	92,667
1970	56,648	17,141	3,705	77,494	-	-	-	1,651	79,145	2,611	81,756
1971	86,042	19,226	3,490	108,758	-	-	-	1,749	110,507	3,178	113,685
1972	70,052	17,855	3,841	91,748	-	-	-	1,092	92,840	1,769	94,609
1973	56,981	13,859	3,204	74,044	-	-	-	1,309	75,353	2,199	77,552
1974	71,840	17,948	3,480	93,268	685	2,663	1,473	4,821	98,089	1,808	99,897
1975	44,585	11,315	4,177	60,077	389	2,872	500	3,761	63,838	3,000	66,838
1976	62,410	16,556	4,148	83,114	409	3,151	1,102	4,662	87,776	3,500	91,276
1977	69,915	16,722	3,965	90,602	985	4,162	1,008	6,155	96,757	4,720	101,477
1978	59,006	32,924	2,916	94,846	608	3,079	635	4,322	99,168	2,975	102,143
1979	75,007	41,498	5,018	121,523	1,989	3,389	772	6,150	127,673	6,175	133,848
1980	90,382	50,004	5,240	145,626	1,521	4,891	1,947	8,359	153,985	9,500	163,485
1981	99,506	45,781	4,023	149,310	1,347	6,374	987	8,708	158,018	8,593	166,611
1982	74,450	39,132	2,609	116,191	1,087	5,385	981	7,453	123,644	8,640	132,284
1983	95,457	43,229	4,106	142,792	601	3,606	911	5,118	147,910	13,027	160,937
1984	74,671	36,697	3,039	114,407	961	3,669	867	5,497	119,904	9,885	129,789
1985	90,011	48,365	2,588	140,964	664	3,418	1,142	5,224	146,188	12,573	158,761
1986	53,035	41,849	901	95,785	502	2,733	950	4,185	99,970	10,797	110,767
5 Yr Ave 1976-80	71,344	31,541	4,257	107,142	1,102	3,734	1,093	5,930	113,072	5,374	118,446
5 Yr Ave 1981-85	86,819	42,641	3,273	132,733	932	4,490	978	6,400	139,133	10,544	149,676

1/ Sales reported in numbers of fish sold in the round.

Appendix Table 3. Commercial summer chum salmon sales by district, Yukon River drainage, 1961-1986. 1/

	Lower Yukon Area				Upper Yukon Area								Alaska Total	
					Dist. 4		Dist. 5		Dist. 6		Subtotal			
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe 2/	Numbers	Roe 2/	Numbers	Roe 2/	Numbers	Roe 2/	Numbers	
1961	-	-	-	0	-	-	-	-	-	-	0	0	0	
1962	-	-	-	0	-	-	-	-	-	-	0	0	0	
1963	-	-	-	0	-	-	-	-	-	-	0	0	0	
1964	-	-	-	0	-	-	-	-	-	-	0	0	0	
1965	-	-	-	0	-	-	-	-	-	-	0	0	0	
1966	-	-	-	0	-	-	-	-	-	-	0	0	0	
1967	9,453	1,425	57	10,935	-	-	-	-	-	-	0	0	10,935	
1968	12,995	1,407	68	14,470	-	-	-	-	-	-	0	0	14,470	
1969	56,886	5,080	-	61,966	-	-	-	-	-	-	0	0	61,966	
1970	117,357	19,649	-	137,006	-	-	-	-	-	-	0	0	137,006	
1971	93,928	6,112	50	100,090	-	-	-	-	-	-	0	0	100,090	
1972	114,234	20,907	527	135,668	-	-	-	-	-	-	0	0	135,668	
1973	221,644	63,402	463	285,509	-	-	-	-	-	-	0	0	285,509	
1974	466,004	74,152	1,721	541,877	27,866	-	6,831	-	13,318	-	48,015	0	589,892	
1975	418,323	99,139	-	517,462	165,054	-	12,997	-	14,782	-	192,833	0	710,295	
1976	273,204	99,190	9,802	382,196	211,307	-	774	-	6,617	-	218,698	0	600,894	
1977	250,652	105,679	3,412	359,743	169,541	-	1,274	-	4,317	-	175,132	0	534,875	
1978	393,785	227,548	27,003	648,336	364,184	16,920	4,892	605	34,814	8,236	403,890	25,761	1,052,226	
1979	369,934	172,838	40,015	582,787	169,430	35,317	8,608	1,009	18,491	3,891	196,529	40,217	779,316	
1980	391,252	308,704	44,782	744,738	147,560	135,824	456	-	35,855	3,282	183,871	139,106	928,609	
1981	507,158	351,878	54,471	913,507	59,718	187,032	1,236	49	32,477	1,987	93,431	189,068	1,006,938	
1982	249,516	182,344	4,086	435,946	3,647	151,281	234	21	21,597	1,517	25,478	152,819	461,424	
1983	451,164	248,092	14,600	713,856	6,672	148,125	42	1,856	24,309	18	31,023	149,999	744,879	
1984	292,676	236,931	1,087	530,694	1,009	166,842	645	47	56,249	335	57,903	167,224	588,597	
1985	247,486	188,099	1,792	437,377	12,007	247,085	700	-	66,913	1,540	79,620	248,625	516,997	
1986	381,127	288,427	442	669,996	300	269,545	690	-	50,483	2,146	51,473	271,691	721,469	
5 Yr Ave 1976-80	335,765	182,792	25,003	543,560	212,404	37,612	20,407	1,762	20,019	3,082	235,624	41,017	779,184	
5 Yr Ave 1981-85	349,600	241,469	15,207	606,276	16,611	180,073	571	395	40,309	1,079	57,491	181,547	663,767	

1/ Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
2/ May include small amounts of chinook salmon roe.

Appendix Table 4. Commercial fall chum salmon sales by district and country, Yukon River drainage, 1961-1986. 1/

	Lower Yukon Area				Upper Yukon Area										
					Dist. 4		Dist. 5		Dist. 6		Subtotal	Alaska Total			
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe 2/	Numbers	Roe 2/	Numbers	Roe 2/	Numbers	Roe 2/	Numbers	Canada Total	Grand Total
1961	42,461	-	-	42,461	-	-	-	-	-	-	0	0	42,461	3,276	45,737
1962	53,116	-	-	53,116	-	-	-	-	-	-	0	0	53,116	936	54,052
1963	-	-	-	0	-	-	-	-	-	-	0	0	0	2,196	2,196
1964	8,347	-	-	8,347	-	-	-	-	-	-	0	0	8,347	1,929	10,276
1965	22,936	-	-	22,936	-	-	-	-	-	-	381	0	23,317	2,071	25,388
1966	69,836	-	1,209	71,045	-	-	-	-	-	-	0	0	71,045	3,157	74,202
1967	36,451	-	1,823	38,274	-	-	-	-	-	-	0	0	38,274	3,343	41,617
1968	49,857	-	3,068	52,925	-	-	-	-	-	-	0	0	52,925	453	53,378
1969	128,866	-	1,722	130,588	-	-	-	-	-	-	722	0	131,310	2,279	133,589
1970	200,306	4,858	3,285	208,449	-	-	-	-	-	-	1,146	0	209,595	2,479	212,074
1971	188,533	-	-	188,533	-	-	-	-	-	-	1,061	0	189,594	1,761	191,355
1972	136,711	12,898	1,313	150,922	-	-	-	-	-	-	1,254	0	152,176	2,532	154,708
1973	173,783	45,304	-	219,087	-	-	-	-	-	-	13,003	0	232,090	2,806	234,896
1974	176,036	53,540	552	230,128	9,213	-	23,551	-	26,884	-	59,648	0	289,776	2,544	292,320
1975	158,183	51,666	5,590	215,439	13,666	-	27,212	-	18,692	-	59,570	0	275,009	2,500	277,509
1976	105,851	21,212	4,250	131,313	1,742	-	5,387	-	17,948	-	25,077	0	156,390	1,000	157,390
1977	131,758	51,994	15,851	199,603	13,980	-	25,730	-	18,673	-	58,383	0	257,986	3,990	261,976
1978	127,947	51,646	11,527	191,120	10,988	1,721	21,016	5,220	13,259	3,687	45,263	10,628	236,383	3,356	239,739
1979	109,406	94,042	25,955	229,403	48,899	3,199	47,459	8,097	34,185	7,170	130,543	18,466	359,946	9,084	369,030
1980	106,829	83,881	13,519	204,229	27,978	4,347	41,771	605	19,452	68	89,201	5,020	293,430	9,000	302,430
1981	167,834	154,883	19,043	341,760	12,082	1,311	86,620	6,955	25,989	3,019	124,691	11,285	466,451	15,260	481,711
1982	97,484	96,581	5,815	199,880	3,894	167	13,593	42	6,820	596	24,307	805	224,187	11,312	235,499
1983	124,371	85,645	10,018	220,034	4,482	1,963	43,993	-	34,089	3,101	82,564	5,064	302,598	25,990	328,588
1984	78,751	70,803	6,429	155,983	7,625	2,215	24,060	57	20,564	56	52,249	2,328	208,232	22,932	231,164
1985	129,948	40,490	5,164	175,602	24,452	2,525	25,338	-	42,352	-	92,142	2,525	267,744	35,746	303,490
1986	59,352	51,307	2,793	113,452	2,045	-	22,053	395	1,892	182	25,990	577	139,442	11,464	150,906
5 Yr Ave 1976-80	116,358	60,555	14,220	191,134	20,717	1,853	28,273	2,784	20,703	2,185	69,693	6,823	260,827	5,286	266,113
5 Yr Ave 1981-85	119,678	89,680	9,294	218,652	10,507	1,636	38,721	1,411	25,963	1,354	75,191	4,401	293,842	22,248	316,090

1/ Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
2/ May include small amounts of coho salmon roe.

Appendix Table 5. Commercial coho salmon sales by district, Yukon River drainage, 1961-1986. 1/

Year	Lower Yukon Area				Upper Yukon Area				Alaska Total
	Dist.1	Dist.2	Dist.3	Subtotal	Dist.4	Dist.5	Dist.6	Subtotal	
1961	2,855	-	-	2,855	-	-	-	0	2,855
1962	22,926	-	-	22,926	-	-	-	0	22,926
1963	5,572	-	-	5,572	-	-	-	0	5,572
1964	2,446	-	-	2,446	-	-	-	0	2,446
1965	350	-	-	350	-	-	-	0	350
1966	19,254	-	-	19,254	-	-	-	0	19,254
1967	9,925	-	1,122	11,047	-	-	-	0	11,047
1968	13,153	-	150	13,303	-	-	-	0	13,303
1969	13,989	-	1,009	14,998	-	-	-	95	15,093
1970	12,632	-	-	12,632	-	-	-	556	13,188
1971	12,165	-	-	12,165	-	-	-	38	12,203
1972	21,705	506	-	22,211	-	-	-	22	22,233
1973	34,860	1,781	-	36,641	-	-	-	0	36,641
1974	13,713	176	-	13,889	-	1,409	1,479	2,888	16,777
1975	2,288	200	-	2,488	-	5	53	58	2,546
1976	4,064	17	-	4,081	-	-	1,103	1,103	5,184
1977	31,720	5,319	538	37,577	-	2	1,284	1,286	38,863
1978	16,460	5,835	758	23,053	32	1	3,066	3,099	26,152
1979	11,369	2,850	-	14,219	155	-	2,791	2,946	17,165
1980	4,829	2,660	-	7,489	30	-	1,226	1,256	8,745
1981	13,129	7,848	419	21,396	-	-	2,284	2,284	23,680
1982	15,115	14,179	87	29,381	15	-	7,780	7,795	37,176
1983	4,595	2,557	-	7,152	-	-	6,168	6,168	13,320
1984	29,472	43,064	621	73,157	1,095	-	7,688	8,783	81,940
1985	27,676	17,125	171	44,972	938	-	11,762	12,700	57,672
1986	24,824	21,197	793	46,814	-	-	441	441	47,255
5 Yr Ave 1976-80	13,688	3,336	259	17,284	43	1	1,894	1,938	19,222
5 Yr Ave 1981-85	17,997	16,955	260	35,212	410	0	7,136	7,546	42,758

1/ Sales reported in numbers of fish sold in the round.

Appendix Table 6. Yukon River drainage total estimated commercial related summer chum salmon catch by area and district, 1961-1986.

Year	Lower Yukon Area Total	Upper Yukon Area											Alaska Total 3/
		District 4				District 5			District 6				
		Numbers	Roe 1/	Other 2/	Subtotal 3/	Numbers	Roe 1/	Subtotal 4/	Numbers	Roe 1/	Subtotal 4/	Total 3/	
1961	0	-	-	-	0	-	-	0	-	-	0	0	0
1962	0	-	-	-	0	-	-	0	-	-	0	0	0
1963	0	-	-	-	0	-	-	0	-	-	0	0	0
1964	0	-	-	-	0	-	-	0	-	-	0	0	0
1965	0	-	-	-	0	-	-	0	-	-	0	0	0
1966	0	-	-	-	0	-	-	0	-	-	0	0	0
1967	10,935	-	-	-	0	-	-	0	-	-	0	0	10,935
1968	14,470	-	-	-	0	-	-	0	-	-	0	0	14,470
1969	61,966	-	-	-	0	-	-	0	-	-	0	0	61,966
1970	137,006	-	-	-	0	-	-	0	-	-	0	0	137,006
1971	100,090	-	-	-	0	-	-	0	-	-	0	0	100,090
1972	135,668	-	-	-	0	-	-	0	-	-	0	0	135,668
1973	285,509	-	-	-	0	-	-	0	-	-	0	0	285,509
1974	541,877	27,866	-	-	27,866	6,831	-	6,831	13,318	-	13,318	48,015	589,892
1975	517,462	165,054	-	-	165,054	12,997	-	12,997	14,782	-	14,782	192,833	710,295
1976	382,196	211,307	-	-	211,307	774	-	774	6,617	-	6,617	218,698	600,894
1977	359,743	169,541	-	-	169,541	1,274	-	1,274	4,317	-	4,317	175,132	534,875
1978	648,336	364,184	16,920	0	381,104	4,892	605	5,497	34,814	8,236	43,050	429,651	1,077,987
1979	582,787	169,430	35,317	0	204,747	8,608	1,009	9,617	18,491	3,891	22,382	236,746	819,533
1980	744,738	147,560	135,824	98,760 5/	382,144	456	-	456	35,855	3,282	39,137	421,737	1,166,475
1981	913,507	59,718	187,032 6/	83,695 7/	330,445	1,236	49	1,285	32,477	1,987	34,464	366,194	1,279,701
1982	435,946	3,647	151,281 6/	102,791 7/	257,719	234	21	255	21,597	1,517	23,114	281,088	717,034
1983	713,856	6,672	148,125 6/	100,591 7/	255,388	42	1,856	1,898	24,309	18	24,327	281,613	995,469
1984	530,694	1,009	166,842 6/	110,219 7/	278,070	645	47	692	56,249	335	56,584	335,346	866,040
1985	437,377	12,007	247,085 6/	168,391 7/	427,483	700	-	700	66,913	1,540	68,453	496,636	934,013
1986	669,996	300	269,545 6/	195,690 7/	465,535	690	-	690	50,483	2,146	52,629	518,854	1,188,850
5 Yr Ave 1981-85	606,276	16,611	180,073	113,137	309,821	571	395	966	40,309	1,079	41,388	352,175	958,451

1/ One pound of roe is equivalent to one female chum salmon.
2/ Other refers to estimated number of males taken incidentally during roe fishery which were not sold.
3/ Subtotals may not be the same as those in Appendix Table 29, since many females stripped of roe and incidental males are reported as subsistence catches.
4/ Subtotals may not be the same as those in Appendix Table 29, since females stripped of roe and incidental males are believed to be reported as subsistence catches.
5/ Calculated by dividing pounds of roe by proportion of females captured at Stink Creek test fishery, subtracted by pounds of roe. Some of these males may have been sold in the round.
6/ Assume all fish sold in the round were males.
7/ Calculated by dividing pounds of roe by proportion of females captured at Stink Creek test fishery, subtracted by pounds of roe and fish sold in the round.

Appendix Table 7. Commercial Fisheries Entry Commission (CFEC) salmon permits issued by gear type, Yukon area, 1976-1986. 1/

Year	Lower Yukon Gill Net 2/		Upper Yukon Gill Net 3/		Upper Yukon Fishwheel	
	Permits Issued 4/	Permits Fished	Permits Issued 4/	Permits Fished	Permits Issued 4/	Permits Fished
1976	678	5/	118	5/	169	5/
1977	700	606	69	44	160	130
1978	699	642	71	47	158	137
1979	708	659	70	50	165	127
1980	709	650	71	49	163	127
1981	711	666	70	45	162	125
1982	710	664	76	45	166	111
1983	708	655	73	40	164	114
1984	708	673	73	39	159	96
1985	708	663	71	40	159	113
1986	707	672 6/	71	30 6/	161	132 6/

1/ Information for 1976-1986 obtained from CFEC.
2/ Set or drift gill net.
3/ Set gill net only.
4/ Includes permanent and interim-use permits.
5/ Information unavailable.
6/ Data source: ADF&G.

Appendix Table 8. Number of commercial salmon fishing gear operators (permit holders) by district, Yukon area, 1971-1986. 1/

CHINOOK SALMON SEASON

	Lower Yukon Area 2/				Upper Yukon Area				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	405	154	33	592	-	-	-	-	592
1972	426	153	35	614	-	-	-	-	614
1973	438	167	38	643	-	-	-	-	643
1974	396	154	42	592	27	31	20	78	670
1975	441	149	37	627	93	52	36	181	808
1976	453	189	42	684	80	46	29	155	839
1977	392	188	46	626	87	41	18	146	772
1978	429	204	22	655	80	45	35	160	815
1979	425	210	22	657	87	34	30	151	808
1980	407	229	21	657	79	35	33	147	804
1981	448	225	23	696	80	43	26	149	845
1982	450	225	21	696	74	44	20	138	834
1983	444	212	19	675	77	34	25	136	811
1984	439	213	20	672	54	31	27	112	784
1985	421	219	18	658	74	32	27	133	791
1986	431	235	7	673	75	21	27	123	796

FALL SEASON

	Lower Yukon Area 3/				Upper Yukon Area 4/				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	352	-	-	352	-	-	-	-	352
1972	353	75	3	431	-	-	-	-	431
1973	445	183		628	-	-	-	-	628
1974	322	121	6	449	17	23	22	62	511
1975	428	185	12	625	44	33	33	110	735
1976	422	194	28	644	18	36	44	98	742
1977	337	172	37	546	28	34	32	94	640
1978	429	204	28	661	24	43	30	97	758
1979	458	220	32	710	31	44	37	112	822
1980	395	232	23	650	33	43	26	102	752
1981	462	240	21	723	30	50	30	110	833
1982	445	218	15	678	15	24	25	64	742
1983	455	225	20	700	13	29	23	65	765
1984	427	216	12	655	18	39	26	83	738
1985	416	236	13	665	22	39	25	86	751
1986	377	236	14	627	1	21	16	38	665

COMBINED SEASONS

	Lower Yukon Area				Upper Yukon Area				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	473	154	33	660	-	-	-	27	687
1972	476	153	35	664	-	-	-	-	664
1973	529	205	38	772	-	-	-	47	819
1974	485	190	42	717	28	43	27	98	815
1975	491	197	39	727	95	57	46	198	925
1976	482	220	44	746	96	62	56	214	960
1977	402	208	54	664	96	53	39	188	852
1978	472	221	29	722	82	53	38	173	895
1979	461	230	33	724	90	49	40	179	903
1980	432	247	27	706	88	51	38	177	883
1981	507	257	26	790	94	56	31	181	971
1982	486	244	22	752	76	53	27	156	908
1983	458	235	26	719	79	47	31	157	876
1984	453	238	26	717	58	45	33	136	853
1985	434	247	24	705	76	48	33	157	862
1986	444	259	18	721	75	30	27	132	853

1/ Actual number of gear operators which made at least one delivery. Some individual fishermen in the lower Yukon area may have operated in more than one district during the year.
2/ Unrestricted mesh size fishing periods.
3/ Refers to time when 6" or smaller mesh size restriction is in effect after the chinook salmon season.
4/ Refers to time when fall chum salmon fishery occurs.

Appendix Table 9. Commercial chinook salmon catches by statistical area, lower Yukon area, 1971-1986.

District 1

Year	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	Total
1971	3,038	25,679	7,204	10,576	17,140	3,949	12,446	6,010	86,042
1972	2,845	12,307	3,608	9,403	18,582	5,331	13,469	4,507	70,052
1973	7,475	29,962	4,657	3,647	1,371	276	7,184	2,409	56,981
1974	2,935	30,174	6,984	3,987	12,721	2,048	6,826	6,165	71,840
1975	6,396	15,844	8,763	314	1,720	606	6,879	4,063	44,585
1976	8,333	27,937	7,507	851	5,101	1,415	6,164	5,102	62,410
1977	11,278	16,787	8,866	1,216	15,214	1,550	7,109	7,895	69,915
1978	886	12,237	4,135	4,388	22,019	3,738	7,533	4,070	59,006
1979	1,017	13,152	4,149	5,782	12,839	10,960	18,976	8,202	75,077
1980	464	12,832	3,235	9,224	30,737	12,333	13,654	7,903	90,382
1981	6,639	12,875	2,975	8,976	19,730	15,158	22,251	10,902	99,506
1982	3,439	11,268	2,842	9,038	9,331	7,295	18,185	13,052	74,450
1983	7,919	23,523	8,161	14,961	9,416	5,297	19,172	7,008	95,457
1984	14,385	15,320	2,598	6,297	11,123	1,434	19,089	4,425	74,671
1985	4,233	22,696	12,160	2,492	12,806	3,955	25,144	6,525	90,011
1986	4,187	7,954	3,494	5,430	10,258	1,422	15,948	4,342	53,035

District 2

Year	334-21	334-22	334-23	334-24	334-25	Total
1971	5,926	7,893	3,061	2,346	-	19,226
1972	1,839	11,216	1,426	3,374	-	17,855
1973	5,959	5,574	1,106	1,220	-	13,859
1974	6,344	5,611	2,624	3,369	-	17,948
1975	3,282	3,045	2,785	2,203	-	11,315
1976	5,083	4,490	3,031	3,952	-	16,556
1977	6,577	4,584	2,110	3,451	-	16,722
1978	9,004	7,953	5,248	8,499	2,220	32,924
1979	10,698	11,214	6,733	7,573	5,280	41,498
1980	11,544	12,903	8,259	9,591	7,707	50,004
1981	12,341	13,275	7,024	5,950	7,191	45,781
1982	10,567	9,236	5,262	8,932	5,135	39,132
1983	12,433	10,424	7,779	6,260	6,333	43,229
1984	9,179	11,573	4,668	5,752	5,525	36,697
1985	11,843	18,584	4,877	4,613	8,448	48,365
1986	11,138	15,326	3,450	4,336	7,599	41,849

District 3

Year	334-31	334-32	Total
1971	1,352	2,138	3,490
1972	1,783	2,058	3,841
1973	2,264	940	3,204
1974	1,423	2,057	3,480
1975	2,791	1,386	4,177
1976	1,827	2,321	4,148
1977	1,617	2,348	3,965
1978	746	2,170	2,916
1979	2,195	2,823	5,018
1980	2,039	3,201	5,240
1981	1,241	2,782	4,023
1982	896	1,713	2,609
1983	1,335	2,771	4,106
1984	900	2,139	3,039
1985	854	1,734	2,588
1986	606	295	901

Appendix Table 10. Commercial chinook salmon catches by statistical area, upper Yukon area, 1974-1986.

District 4

Year	334-41	334-42	334-43	Total
1974	0	685	-	685
1975	15	374	-	389
1976	44 1/	365	-	409
1977	317	668	-	985
1978	183	425	-	608
1979	785	370	834	1,989
1980	352	549	620	1,521
1981	106	867	374	1,347
1982	78	497	512	1,087
1983	0	382	219	601
1984	2	272	687	961
1985	0	318	346	664
1986	11	100	391	502

District 5

Year	334-51	334-52	334-53	334-54	Total
1974	2,284	379	-	-	2,663
1975	2,602	270	-	-	2,872
1976	2,843	308	-	-	3,151
1977	4,013	149	-	-	4,162
1978	2,838	241	-	-	3,079
1979	3,389	0	-	-	3,389
1980	4,554	337	-	-	4,891
1981	97	3,051	2,477	749	6,374
1982	61	2,352	2,277	695	5,385
1983	0	632	2,738	236	3,606
1984	128	1,589	1,568	384	3,669
1985	0	1,142	1,842	434	3,418
1986	0	1,552	875	306	2,733

District 6

Year	334-61	334-62	334-63	Total
1974	111	1,102	260	1,473
1975	77	153	270	500
1976	490	320	292	1,102
1977	405	365	238	1,008
1978	34	58	543	635
1979	102	336	334	772
1980	92	1,588	267	1,947
1981	438	366	183	987
1982	414	309	258	981
1983	249	364	298	911
1984	0	375	492	867
1985	15	560	567	1,142
1986	0	597	353	950

1/ Does not include 493 fish (summer chum salmon) erroneously keypunched as chinook salmon in final computer summary.

Appendix Table 11. Commercial catches of chinook and summer chum salmon by mesh size, Districts 1 and 2, lower Yukon area, 1961-1986.

	Unrestricted Mesh Size 1/		6 inch Max. Mesh Size 2/	
	Districts 1 and 2		Districts 1 and 2	
Year	Chinook	Summer Chum	Chinook	Summer Chum
1961	113,434	-	-	-
1962	89,296	-	-	-
1963	109,215	-	-	-
1964	87,801	-	-	-
1965	113,031	-	-	-
1966	87,710	-	-	-
1967	124,574	10,919	-	-
1968	100,857	14,402	-	-
1969	85,387	41,418	97	15,437
1970	73,610	104,705	57	16,623
1971	103,623	42,189	1,176	57,851
1972	85,376	78,698	1,991	37,881
(Avg. 1961-72)	97,826	48,722	830	31,948
1973 3/	65,269	89,841	5,168	196,540
1974	86,921	349,758	1,631	227,507
1975	50,614	148,919	4,162	345,472
1976	71,688	267,075	7,631	128,431
1977	81,073	157,909	4,720	205,634
1978	82,070	275,512	7,737	354,603
1979	95,137	136,973	22,136	434,188
1980	120,912	95,876	19,711	605,679
1981	125,698	163,979	18,648	758,767
1982	106,399	225,106	6,887	217,563
1983	107,078	121,927	31,002	590,329
1984	94,456	242,076	16,394	287,531
1985 4/	114,300	170,345	22,445	265,240
1986	79,525	231,372	15,307	438,182
(Avg. 1979-86)	109,140	165,183	19,603	451,328

1/ Primarily 8 to 8-1/2 inch mesh size used during early June to early July.
2/ Catch through July 15-20, relatively few chinook and summer chum salmon taken after these dates.
3/ Six inch maximum mesh size regulation beginning late June to early July became effective in 1973.
4/ Six inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

Appendix Table 12. Commercial chinook salmon catch and effort data, Districts 1 and 2, lower Yukon area, 1961-1986. 1/

Commercial Catch

Year	Dist. 1	Dist. 2	Total
1961	84,406	29,028	113,434
1962	67,072	22,224	89,296
1963	85,004	24,211	109,215
1964	67,555	20,246	87,801
1965	89,268	23,763	113,031
1966	70,783	16,927	87,710
1967	104,335	20,239	124,574
1968	79,465	21,392	100,857
1969	70,588	14,799	85,387
1970	56,469	17,141	73,610
1971	84,397	19,226	103,623
1972	68,059	17,317	85,376
1973	52,790	12,479	65,269
1974	69,457	17,464	86,921
1975	41,550	9,064	50,614
1976	56,392	15,296	71,688
1977	65,745	15,328	81,073
1978	53,198	28,872	82,070
1979	61,790	33,347	95,137
1980	78,157	42,755	120,912
1981	88,038	37,660	125,698
1982	70,743	35,656	106,399
1983	76,280	30,798	107,078
1984	65,101	29,355	94,456
1985	76,106	38,194	114,300
1986	42,922	36,603	79,525

Effort

	District 1		District 2		Total	
	Boat Hrs	CPUE	Boat Hrs	CPUE	Boat Hrs	CPUE
1961	79,224	1.07	29,118	1.00	108,342	1.05
1962	84,792	0.79	38,118	0.58	122,910	0.73
1963	72,288	1.18	27,672	0.87	99,960	1.09
1964	56,736	1.19	22,398	0.90	79,134	1.11
1965	78,096	1.14	31,008	0.77	109,104	1.04
1966	69,894	1.01	22,380	0.76	92,274	0.95
1967	102,456	1.02	37,488	0.54	139,944	0.89
1968	92,450	0.86	32,280	0.66	124,730	0.81
1969	84,864	0.83	27,828	0.53	112,692	0.76
1970	61,260	0.92	20,460	0.84	81,720	0.90
1971	73,272	1.15	19,956	0.96	93,228	1.11
1972	79,236	0.86	19,872	0.87	99,108	0.86
1973	75,036	0.70	23,496	0.53	98,532	0.66
1974	86,256	0.81	29,808	0.59	116,064	0.75
1975	49,944	0.83	8,376	1.08	58,320	0.87
1976	64,572	0.87	23,484	0.65	88,056	0.81
1977	42,618	1.54	15,180	1.01	57,798	1.40
1978	57,528	0.92	25,524	1.13	83,052	0.99
1979	53,040	1.16	23,904	1.40	76,944	1.24
1980	45,348	1.72	20,196	2.12	65,544	1.84
1981	43,632	2.02	19,536	1.93	63,168	1.99
1982	55,416	1.28	22,008	1.62	77,424	1.37
1983	38,448	1.98	18,696	1.65	57,144	1.87
1984	38,880	1.67	14,568	2.02	53,448	1.77
1985	28,176	2.70	14,832	2.58	43,008	2.66
1986	36,936	1.16	20,352	1.80	57,288	1.39

1/ Chinook salmon season during June and early July with unrestricted mesh size gill nets.

Appendix Table 13. Chinook salmon commercial catch data by period, chinook salmon season (unrestricted mesh size), District 1, lower Yukon area, 1972-1986.

	Period Catch 1/ (Cumulative Catch) 2/														
Date	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
06/01															
06/02															
06/03															
06/04															
06/05			3.5(3.5)					6.1(6.1)							
06/06		0.3(0.3)													
06/07										11.1(11.1)					
06/08			7.5(11.0)					4.9(11.0)							
06/09		2.5(2.8)					2.5(2.5)			15.6(26.7)					
06/10	0.04(0.04)								6.8(6.8)			22.3(22.3)			
06/11				0.2(0.2)											
06/12			14.7(25.7)					19.5(30.5)		14.5(41.2)					
06/13		6.6(9.4)					5.8(8.3)								
06/14	1.0(1.04)			0.4(0.6)		0.04(0.04)			26.1(32.9)			12.7(35.0)			
06/15			11.1(36.8)								5.6(5.6)				
06/16		12.1(21.5)			0.1(0.1)			9.3(39.8)		18.3(59.5)					
06/17	3.5(4.5)						17.6(25.9)		14.6(47.5)			28.6(63.6)			
06/18				1.1(1.7)		2.6(2.6)					12.4(18.0)				
06/19			18.8(55.6)		3.2(3.3)			16.7(56.5)		28.5(88.0)			13.7(13.7)		
06/20		9.1(30.6)					7.5(33.4)								21.7(21.7)
06/21	17.0(21.5)			5.7(7.4)		10.4(13.0)			26.2(73.7)			12.7(76.3)			
06/22			2.9(58.5)					5.3(61.8)			20.0(38.0)		18.8(32.5)		
06/23		12.0(42.6)			9.6(12.9)				4.5(78.2)						
06/24	16.3(37.8)						14.4(47.8)								10.2(31.9)
06/25				17.1(24.5)		26.3(39.3)				7.1(45.1)			23.6(23.6)		
06/26			7.2(65.7)		15.4(28.3)							16.1(48.6)			
06/27		10.2(52.8)		9.8(34.3)			5.4(53.2)								
06/28	15.4(53.2)					17.7(57.0)							33.7(57.3)		
06/29			3.8(69.5)							18.1(63.2)		16.5(65.1)			
06/30					13.8(42.1)										5.6(37.5)
07/01	14.9(68.1)			7.3(41.6)		8.7(65.7)									
07/02					14.3(56.4)					7.5(70.7)			18.8(76.1)		
07/03															
07/04															5.4(42.9)
07/05															
07/06															
07/07															
07/08															

1/ Catch by period in thousands of fish.
2/ Cumulative catch during unrestricted mesh size fishing periods in thousands of fish.

Appendix Table 14. Chinook salmon commercial catch data by period, chinook salmon season (unrestricted mesh size), District 2, Yukon area, 1978-1986.

	Period Catch 1/ (Cumulative Catch) 2/								
Date	1978	1979	1980	1981	1982	1983	1984	1985	1986
06/01									
06/02									
06/03									
06/04		1.6 (1.6)							
06/05									
06/06									
06/07		1.4 (3.0)							
06/08				7.6 (7.6)					
06/09	4.8 (4.8)		3.9 (3.9)						
06/10									
06/11		5.1 (8.1)		11.4 (19.0)					
06/12	3.2 (8.0)		7.8 (11.7)						
06/13						6.0 (6.0)			
06/14									
06/15		14.2 (22.3)		10.5 (29.5)					
06/16	4.3 (12.3)		10.9 (22.6)			7.3 (13.3)			
06/17					4.0 (4.0)				
06/18		3.9 (26.2)		8.2 (37.7)					
06/19	7.8 (20.1)								
06/20			8.1 (30.7)			10.6 (23.9)			
06/21		7.2 (33.4)			7.8 (11.8)		5.6 (5.6)		
06/22									
06/23	4.1 (24.2)		12.0 (42.7)			6.9 (30.8)			14.5 (14.5)
06/24					11.9 (23.7)				
06/25							14.4 (20.0)		
06/26	4.7 (28.9)								
06/27								7.0 (7.0)	12.3 (26.8)
06/28					3.4 (27.1)		9.4 (29.4)		
06/29									
06/30									
07/01					8.6 (35.7)			18.3 (25.3)	
07/02									7.4 (34.2)
07/03									
07/04								12.9 (38.2)	
07/05									
07/06									
07/07									2.4 (36.6)
07/08									

1/ Catch by period in thousands of fish.
2/ Cumulative catch during unrestricted mesh size fishing periods in thousands of fish.

Appendix Table 15. Commercial salmon catches taken under quotas or guideline harvest ranges, Yukon area, 1974-1986.

Chinook Salmon 1/

Year	Lower Yukon Area: Districts 1 and 2	Lower Yukon Area: District 3	Upper Yukon Area: District 4	Upper Yukon Area: District 5	Upper Yukon Area: District 6
1974	-	3,413 (3,000)	685 (1,000)	2,661 (3,000)	1,473 (1,000)
1975	-	4,177 (3,000)	389 (1,000)	2,865 (3,000)	500 (1,000)
1976	-	4,070 (3,000)	902 (1,000)	3,151 (3,000)	1,102 (1,000)
1977	-	3,938 (3,000)	985 (1,000)	4,162 (3,000)	1,008 (1,000)
1978	-	2,657 (2,000)	701 (1,000)	3,115 (3,000)	635 (1,000)
1979 2/	-	3,073 (1,800-2,200)	1,232 (900-1,100)	3,389 (2,700-3,300)	772 (900-1,100)
1980	-	3,896 (1,800-2,200)	1,517 (900-1,100)	5,383 (2,700-3,300)	2,076 (900-1,100)
1981	145,287 (60,000-120,000)	3,220 (1,800-2,200)	1,347 (2,250-2,850)	6,452 (2,700-3,300)	1,264 (600-800)
1982	113,582 (60,000-120,000)	2,608 (1,800-2,200)	1,107 (2,250-2,850)	5,379 (2,700-3,300)	981 (600-800)
1983	138,686 (60,000-120,000)	3,318 (1,800-2,200)	601 (2,250-2,850)	3,606 (2,700-3,300)	911 (600-800)
1984	111,368 (60,000-120,000)	3,036 (1,800-2,200)	961 (2,250-2,850)	3,669 (2,700-3,300)	867 (600-800)
1985	138,376 (60,000-120,000)	2,587 (1,800-2,200)	664 (2,250-2,850)	3,418 (2,700-3,300)	1,142 (600-800)
1986	94,884 (60,000-120,000)	901 (1,800-2,200)	502 (2,250-2,850)	2,733 (2;700-3,300)	950 (600-800)

Fall Chum and Coho Salmon 1/

Year	Lower Yukon Area 3/: Districts 1, 2, and 3	Upper Yukon Area 4/: District 4 5/	Upper Yukon Area 4/: District 5	Upper Yukon Area 4/: District 6
1974	230,128 (200,000)	9,213 (10,000)	25,051 (25,000)	26,192 (15,000)
1975	215,439 (200,000)	13,552 (10,000)	27,212 (25,000)	18,735 (15,000)
1976	131,313 (200,000)	1,742 (10,000)	5,387 (25,000)	19,051 (15,000)
1977	199,603 (200,000)	13,996 (10,000)	25,695 (25,000)	19,910 (15,000)
1978	191,120 (200,000)	11,262 (10,000)	21,017 (25,000)	16,325 (15,000)
1979 2/	229,403 (120,000-220,000)	50,375 (10,000-40,000)	51,161 (10,000-40,000)	34,316 (7,500-22,500)
1980	204,229 (120,000-220,000)	32,058 (10,000-40,000)	42,343 (10,000-40,000)	20,746 (7,500-22,500)
1981	341,760 (120,000-220,000)	19,447 (10,000-40,000)	95,844 (10,000-40,000)	29,008 (5,500-20,500)
1982	199,880 (120,000-220,000)	3,909 (10,000-40,000)	13,636 (10,000-40,000)	14,600 (5,500-20,500)
1983	220,034 (120,000-220,000)	4,482 (10,000-40,000)	43,993 (10,000-40,000)	40,257 (5,500-20,500)
1984	155,983 (120,000-220,000)	8,720 (10,000-40,000)	24,060 (10,000-40,000)	28,252 (5,500-20,500)
1985	175,602 (120,000-220,000)	25,390 (10,000-40,000)	25,338 (10,000-40,000)	54,112 (5,500-20,500)
1986	113,452 (0-110,000)	2,045 (0-20,000)	22,053 (0-20,000)	2,333 (0-10,250)

1/ Quotas or guideline harvest range shown in parenthesis.
2/ Beginning in 1979 quotas were replaced by guideline harvest level ranges.
3/ Chum salmon only; coho salmon catch not applied toward quotas or G.H.L.
4/ Chum and coho salmon combined; mostly fall chum.
5/ Beginning in 1978 quota or guideline harvest levels in effect for area upstream of Cone Point only. Subdistrict 4-A closes August 1.

Appendix Table 16. Commercial chum salmon catches by statistical area, lower Yukon area, 1971-1986.

District 1

Year	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	Total
1971	834	87,740	24,766	34,891	40,617	8,063	67,635	17,915	282,461
1972	5,186	98,909	12,146	25,943	56,039	4,073	38,274	10,375	250,945
1973	17,259	176,119	39,583	18,608	61,969	6,413	52,770	22,706	395,427
1974	38,322	338,412	116,940	22,011	50,593	5,357	37,724	32,681	642,040
1975	28,970	257,485	103,423	12,078	41,295	5,779	99,232	28,244	576,506
1976	26,277	203,024	52,480	9,338	28,848	2,872	32,093	24,123	379,055
1977	34,312	181,459	54,082	9,872	41,799	1,083	41,026	18,777	382,410
1978	5,072	195,080	67,098	56,995	79,352	4,602	75,090	38,443	521,732
1979	1,791	115,528	38,161	43,263	92,706	46,401	93,777	47,713	479,340
1980	3,840	82,898	16,940	46,164	87,270	98,326	109,005	53,638	498,081
1981	25,569	206,200	26,220	76,591	91,722	51,660	143,747	53,283	674,992
1982	9,908	83,130	17,910	54,795	56,632	20,602	60,263	43,760	347,000
1983	42,300	122,374	40,200	75,016	65,665	42,903	121,328	65,749	575,535
1984	42,579	106,209	17,376	54,519	36,021	12,711	73,710	28,302	371,427
1985	14,290	87,872	32,162	46,932	76,155	11,866	79,846	28,311	377,434
1986	39,844	112,778	38,347	55,663	47,790	10,898	97,802	37,357	440,479

District 2

Year	334-21	334-22	334-23	334-24	334-25	Total
1971	2,255	3,144	286	427	-	6,112
1972	3,091	22,746	250	7,718	-	33,805
1973	22,207	56,193	6,181	24,125	-	108,706
1974	39,116	52,514	11,191	24,871	-	127,692
1975	20,947	98,986	11,028	19,844	-	150,805
1976	22,282	58,016	18,173	21,931	-	120,402
1977	26,158	75,281	23,789	32,445	-	157,673
1978	48,868	132,002	31,990	60,770	5,564	279,194
1979	73,509	86,020	29,988	33,069	44,294	266,880
1980	80,931	156,962	75,513	47,772	31,407	392,585
1981	76,143	215,346	88,040	78,218	49,014	506,761
1982	60,611	103,689	27,600	61,685	25,340	278,925
1983	74,985	76,494	80,631	53,099	48,528	333,737
1984	57,212	114,732	50,738	55,259	29,793	307,734
1985	42,042	98,294	28,513	24,770	34,970	228,589
1986	50,865	145,946	41,516	58,531	42,876	339,734

District 3

Year	334-31	334-32	Total
1971	26	24	50
1972	-	1,840	1,840
1973	-	463	463
1974	1,697	576	2,273
1975	-	5,590	5,590
1976	4,450	9,602	14,052
1977	12,839	6,424	19,263
1978	20,028	18,502	38,530
1979	28,272	37,698	65,970
1980	23,646	34,655	58,301
1981	35,597	37,917	73,514
1982	3,896	6,005	9,901
1983	7,713	16,905	24,618
1984	6,876	640	7,516
1985	5,045	1,911	6,956
1986	3,235	-	3,235

Appendix Table 17. Commercial summer chum salmon catches by statistical area, upper Yukon area, 1974-1986. 1/ 2/

District 4

	334-41		334-42		334-43		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,200	-	28,500	-	3/	3/	27,866	-
1975	105,600	-	59,500	-	3/	3/	165,054	-
1976	178,300	-	33,000	-	3/	3/	211,307	-
1977	148,700	-	20,800	-	3/	3/	169,541	-
1978	309,500	16,920	54,900	0	3/	3/	364,184	16,920
1979	136,300	35,117	29,200	200	3,900	0	169,430	35,317
1980	119,400	119,957	26,200	14,385	1,800	1,482	147,560	135,824
1981	46,000	160,757	11,800	23,677	1,900	2,598	59,718	187,032
1982	1,000	137,611	1,000	12,550	1,600	1,120	3,647	151,281
1983	3,400	130,013	3,300	17,549	0	563	6,672	148,125
1984	100	148,519	700	15,184	300	3,139	1,009	166,842
1985	5,100	222,149	1,800	19,306	5,100	5,630	12,007	247,085
1986	0	236,856	241	29,169	59	3,520	300	269,545

District 5

	334-51		334-52		334-53		334-54		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	4,500	-	4/	-	-	-	-	-	6,831	-
1975	13,000	-	0	-	-	-	-	-	12,997	-
1976	700	-	0	-	-	-	-	-	774	-
1977	1,200	-	0	-	-	-	-	-	1,274	-
1978	4,900	605	0	0	-	-	-	-	4,892	605
1979	8,600	1,009	0	0	-	-	-	-	8,608	1,009
1980	500	0	0	0	0	0	0	0	456	0
1981	1,100	0	100	49	0	0	0	0	1,236	49
1982	0	21	200	0	0	0	0	0	234	21
1983	0	242	0	269	0	1,345	0	0	42	1,856
1984	100	0	600	47	0	0	0	0	645	47
1985	0	0	700	0	0	0	0	0	700	0
1986	0	0	682	0	8	0	0	0	690	0

District 6

	334-61		334-62		334-63		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,500	-	10,500	-	1,300	-	13,318	-
1975	5,500	-	2,300	-	6,900	-	14,782	-
1976	2,900	-	1,200	-	2,500	-	6,617	-
1977	2,300	-	1,300	-	700	-	4,317	-
1978	2,200	1,468	27,900	6,116	4,800	652	34,814	8,236
1979	300	4/	14,800	4/	3,500	4/	18,491	3,891
1980	5,200	0	29,400	2,272	4,300	1,010	35,855	3,282
1981	4,600	0	23,500	925	4,200	1,062	32,477	1,987
1982	5,000	0	12,500	1,027	4,200	490	21,597	1,517
1983	1,900	0	21,600	18	700	0	24,309	18
1984	3,800	0	42,200	152	10,200	183	56,249	335
1985	800	0	51,100	142	15,000	1,398	66,913	1,540
1986	4,697	0	31,647	1,711	14,139	435	50,483	2,146

1/ Roe in pounds and may include small amounts of chinook salmon roe.
2/ Majority of summer chum salmon catches rounded to nearest 100.
3/ Combined with statistical area 334-42.
4/ Information not available.

Appendix Table 18. Commercial fall chum salmon catches by statistical area, upper Yukon area, 1974-1986. 1/ 2/

District 4

	334-41		334-42		334-43		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	-	-	9,213	-	3/	3/	9,213	-
1975	2,200	-	11,400	-	3/	3/	13,666	-
1976	400	-	1,300	-	3/	3/	1,742	-
1977	1,700	-	12,300	-	3/	3/	13,980	-
1978	-	-	11,000	1,721	3/	3/	10,988	1,721
1979	-	-	33,000	3,199	15,900	0	48,899	3,199
1980	-	-	15,300	1,789	12,900	2,558	27,978	4,347
1981	-	-	5,800	1,311	6,300	0	12,082	1,311
1982	-	-	1,000	20	2,900	147	3,894	167
1983	-	-	3,700	1,591	800	372	4,482	1,963
1984	-	-	3,000	1,222	4,700	993	7,625	2,215
1985	-	-	14,500	891	10,000	1,634	24,452	2,525
1986	-	-	2,045	0	0	0	2,045	0

District 5

	334-51		334-52		334-53		334-54		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	23,600	-	4/	-	-	-	-	-	23,551	-
1975	27,212	-	-	-	-	-	-	-	27,212	-
1976	5,300	-	100	-	-	-	-	-	5,387	-
1977	25,600	-	0	-	-	-	-	-	25,730	-
1978	20,700	3,946	300	1,274	-	-	-	-	21,016	5,220
1979	47,400	8,097	100	0	-	-	-	-	47,459	8,097
1980	40,300	605	2,000	0	0	0	0	0	41,771	605
1981	0	178	34,000	6,760	48,600	17	4,100	0	86,620	6,955
1982	8,300	0	1,100	23	4,300	19	0	0	13,593	42
1983	3,100	0	19,800	0	18,000	0	3,100	0	43,993	0
1984	1,400	0	10,300	0	9,400	0	2,900	57	24,060	57
1985	600	0	9,300	0	13,300	0	2,200	0	25,338	0
1986	1,332	0	11,907	395	7,471	0	1,343	0	22,053	395

District 6

	334-61		334-62		334-63		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	9,600	-	15,400	-	1,900	-	26,884	-
1975	13,300	-	2,800	-	2,600	-	18,692	-
1976	6,400	-	7,900	-	3,600	-	17,948	-
1977	3,600	-	11,100	-	3,900	-	18,673	-
1978	4,700	1,826	8,000	1680	500	181	13,259	3,687
1979	7,100	4/	21,600	4/	5,500	4/	34,185	7,170
1980	6,300	0	11,200	53	2,200	15	19,452	68
1981	4,900	0	18,900	2784	2,300	235	25,989	3,019
1982	700	0	4,600	596	1,500	0	6,820	596
1983	3,500	0	23,100	3009	7,500	92	34,089	3,101
1984	5,600	0	11,800	0	3,200	56	20,564	56
1985	1,500	0	34,700	0	6,200	0	34,352	0
1986	176	0	1,345	182	371	0	1,892	182

1/ Roe in pounds and may include small amounts of coho salmon roe.
2/ Majority of fall chum salmon catches rounded to nearest 100.
3/ Combined with statistical area 334-42.
4/ Information not available.

Appendix Table 19. Commercial summer chum salmon catch and effort data, Districts 1 and 2, lower Yukon area, 1967-1986.

	District 1					District 2				
Year	Duration	Days Fished	Boat Hours	Catch	(Catch/Boat Hour)	Duration	Days Fished	Boat Hours	Catch	(Catch/Boat Hour)
1967	6/08-6/27	11.0	77,208	9,494	0.12	-	-	-	-	-
1968	6/06-7/03	14.0	91,380	12,995	0.14	6/13-7/02	10.5	27,600	1,407	0.05
1969	6/02-6/28	12.5	84,864	8,840	0.10	6/15-7/01	8.0	16,620	5,024	0.30
1970	6/11-7/03	10.5	58,056	87,169	1.50	6/14-7/03	9.0	15,756	17,536	1.11
1971	6/14-7/03	10.5	73,032	36,077	0.49	6/20-7/05	8.5	17,832	6,112	0.34
1972	6/08-7/01	12.5	79,236	69,658	0.88	6/15-7/01	8.5	19,296	9,040	0.47
1973 1/	6/07-7/11	14.5	100,284	191,840	1.91	6/10-7/14	14.5	36,000	56,481	1.57
1974	6/03-7/13	16.5	114,624	461,025	4.02	6/05-7/16	15.5	35,316	72,281	2.05
1975	6/09-7/16	15.0	86,304	394,447	4.57	6/11-7/18	10.5	21,024	99,139	4.72
1976	6/14-7/14	12.0	90,658	272,493	3.01	6/20-7/16	11.0	32,624	99,190	3.04
1977	6/13-7/12	12.0	63,036	232,427	3.69	6/19-7/15	10.0	27,048	102,759	3.80
1978	6/08-7/15	13.5	100,008	393,785	3.94	6/08-7/14	13.5	44,376	218,196	4.92
1979	6/04-7/14	13.5	106,680	369,934	3.47	6/03-7/13	13.5	44,748	172,838	3.86
1980	6/09-7/15	12.8	89,412	391,252	4.38	6/08-7/17	12.5	48,060	308,704	6.42
1981	6/06-7/14	12.0	94,656	507,158	5.36	6/07-7/16	12.0	46,560	351,458	7.55
1982	6/14-7/13	9.5	81,240	248,950	3.06	6/16-7/16	10.0	37,920	180,321	4.76
1983	6/09-7/15	11.0	94,920	451,164	4.75	6/12-7/18	11.0	44,712	248,092	5.55
1984	6/18-7/13	8.0	67,776	291,966	4.31	6/20-7/16	8.0	32,208	234,677	7.29
1985 2/	6/24-7/15	6.3	52,116	247,486	4.75	6/26-7/18	7.3	27,834	188,099	6.76
1986	6/14-7/15	8.5	66,768	381,127	5.71	6/15-7/14	7.5	33,954	288,427	8.49

1/ Six inch maximum mesh size regulation during late June to early July became effective in 1973.
2/ Six inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

Appendix Table 20. Commercial coho and fall chum salmon catch and effort data, District 1, lower Yukon area, 1961-1986.

Year	Duration	Days 1/ Fished	Boat Hours	Coho Catch	Coho (Catch/Boat Hour)	Fall Chum Catch	Fall Chum (Catch/Boat Hour)
1961	8/01-8/31	16	14,772	2,855	0.19	42,461	2.87
1962	8/01-9/03	21	46,950	22,926	0.49	53,116	1.13
1963	8/09-9/06	18	2,100	5,572	2.65	no purchases	
1964	8/03-8/27	17	8,346	2,446	0.29	8,347	1.00
1965	8/02-8/04	2/	2/	350	2/	22,936	2/
1966	7/25-9/10	28	41,994	19,254	0.46	69,836	1.66
1967	7/24-8/27	21	19,272	9,925	0.51	36,451	1.89
1968	7/22-8/28	22	47,232	13,153	0.28	49,857	1.06
1969	7/21-8/23	20	39,408	14,041	0.36	128,866	3.27
1970	7/20-8/26	22	56,160	12,245	0.22	200,306	3.57
1971	7/22-8/28	22	85,344	11,582	0.14	178,744	2.09
1972	7/20-8/26	22	81,726	19,655	0.24	134,752	1.65
1973	7/19-8/25	22	107,136	34,860	0.33	173,783	1.62
1974	7/18-8/14	12	41,868	13,758	0.33	137,235	3.28
1975	7/21-8/16	12	52,128	2,240	0.04	158,183	3.03
1976	7/19-8/13	11	55,026	4,084	0.07	91,091	1.66
1977	7/18-8/23	11	50,568	30,588	0.60	129,486	2.56
1978	7/17-8/29	13	56,184	16,262	0.29	127,947	2.28
1979	7/19-8/14	8	47,352	11,231	0.24	101,400	2.14
1980	7/17-8/19	7	24,216	4,819	0.20	106,829	4.41
1981	7/16-8/17	7	35,520	11,174	0.31	167,834	4.73
1982	7/19-8/13	8	40,944	15,114	0.37	91,271	2.23
1983 3/	7/18-8/12	6	25,848	4,560	0.18	124,371	4.81
1984 3/	7/16-8/17	6	21,240	29,472	1.39	78,751	3.71
1985 3/	7/18-8/13	5	20,592	27,674	1.34	124,801	6.06
1986 4/	8/04-8/22	4	13,662	24,824	1.82	59,352	4.34

1/ One day is equivalent to 24 hours during open fishing period.
2/ Information unavailable.
3/ District was divided into a Set Net Only (24 hour) area and a Gill Net (12 hour) area.
4/ District was divided into a Set Net Only (24 or 12 hour) area and a Gill Net (12 or 6 hour) area.

Appendix Table 21. Fall chum salmon commercial catch data by period, District 1, lower Yukon area, 1977-1986.

	Period Catch (Cumulative Catch) 1/									
Date	1977	1978	1979	1980	1981 2/	1982	1983 3/	1984 4/	1985 5/	1986 6/
07/18		6.3 (6.3)		4.2 (4.2)					6.3 (6.3)	
07/19	21.4 (21.4)						16.1 (16.1)			
07/20			6.0 (6.0)			4.3 (4.3)				
07/21		5.1 (11.4)			6.0 (6.0)					
07/22	2.0 (23.4)			6.6 (10.8)						
07/23						27.8 (32.1)				
07/24			7.2 (13.2)		1.3 (7.3)					
07/25		52.8 (64.2)		10.4 (21.2)						
07/26	9.7 (33.1)									
07/27			14.8 (28.0)			4.0 (36.1)				
07/28		2.8 (67.0)			57.3 (64.6)					
07/29	7.7 (40.8)			15.3 (36.5)			3.0 (19.1)			
07/30						11.7 (47.8)				
07/31			9.7 (37.7)	1.4 (37.9)	23.2 (87.8)			18.3 (18.3)		
08/01		14.4 (81.4)								
08/02	0.9 (41.7)						18.5 (37.6)		2.2 (8.5)	
08/03			17.5 (55.2)					17.1 (35.4)		
08/04		0.4 (81.8)				7.9 (55.7)				
08/05	3.2 (44.9)			6.2 (44.1)			23.7 (61.3)			11.4 (11.4)
08/06						1.2 (56.9)			15.2 (23.7)	
08/07			37.8 (93.0)	13.5 (57.6)				1.8 (37.2)		
08/08		1.4 (83.2)								7.5 (18.9)
08/09	50.0 (94.9)						44.0 (105.3)		35.8 (59.5)	
08/10			1.3 (94.3)			13.7 (70.6)				
08/11		1.6 (84.8)		5.2 (62.8)						
08/12	1.5 (96.4)					20.7 (91.3)	19.1 (124.4)			10.5 (29.4)
08/13					43.8 (131.6)				65.3 (124.8)	
08/14			7.1 (101.4	1.8 (64.6)				11.8 (49.0)		
08/15		1.4 (86.2)								16.2 (45.6)
08/16	16.6 (113.0)									
08/17								10.1 (59.1)		
08/18		10.2 (96.4)			3.9 (135.5)					
08/19				42.2 (106.8)						5.8 (51.4)
08/20	7.0 (120.0)									
08/21										
08/22		21.9 (118.3)								8.0 (59.4)
08/23	5.8 (125.8)									
08/24										
08/25		4.4 (122.7)								
08/26										
08/27										
08/28										
08/29		5.2 (127.9)								
08/30										

1/ Period and cumulative catches in thousands of fish. Fall chum salmon run usually well underway in the lower Yukon River by July 18.
2/ Season closed 8/01-8/12.
3/ Season closed 7/20-7/27.
4/ Season closed 7/18-8/01 and 8/8-8/12.
5/ Season closed 7/20-7/31.
6/ Season closed 7/16-8/03.

Appendix Table 22. Fall Chum and coho salmon commercial catch and effort in the Set Net Only and Gill Net areas, District 1, Yukon area, 1983-1986.

Year	Set Net Area			Gill Net Area			Total		
	No. of Fishermen	Catch	Average Catch per Fisherman	No. of Fishermen	Catch	Average Catch per Fisherman	No. of Fishermen	Catch	Average Catch per Fisherman
Fall Chum Salmon									
1983	137	46,583	340	175	61,649	352	312	108,232	347
1984	137	34,817	254	164	24,307	148	301	59,124	196
1985	159	64,838	408	153	53,694	351	312	118,532	380
1986	122	28,449	233	160	30,903	193	282	59,352	210
Coho Salmon									
1983	137	1,021	7	175	3,536	20	312	4,557	15
1984	137	15,077	110	164	14,390	88	301	29,467	98
1985	159	12,841	81	153	14,832	97	312	27,673	89
1986	122	9,334	77	160	15,490	97	282	24,824	88
Combined									
1983	137	47,604	347	175	65,185	372	312	112,789	362
1984	137	49,894	364	164	38,697	236	301	88,591	294
1985	159	77,679	489	153	68,526	448	312	146,205	469
1986	122	37,783	310	160	46,393	290	282	84,176	298

Appendix Table 23. Commercial salmon pack by species and type of processing, Yukon area, 1960-1986. 1/

	Cases (48#)			Fresh-Frozen (round wt. in lbs.)			Cured Chinook Salmon		Cured Chum Salmon		Salmon Roe (lbs.)
	Chinook	Coho	Chum	Chinook	Coho	Chum	Tierces	1/2 Tierce	Tierces	1/2 Tierce	
1960	13,000			2/	2/	2/	250	180			
1961	19,474			2/	2/	2/	504	146			
1962	15,959	512	1,760	2/	2/	2/	464	280			
1963	16,400	1,190		2/	2/	2/	2/	2/			
1964	12,041			2/	17,000	66,770	537	499			
1965	18,149			275,000	2,500	160,500	670	67			
1966	14,026	836	2,812	414,000	61,355	301,240	398	60			
1967	21,503		126	475,900	66,400	366,496	627	96			1,755
1968	19,499		816	561,690	93,154	454,409	351	170			21,000
1969	9,560	1,104	4,499	423,597	26,973 3/	829,586 3/	647	95	15		29,000
1970	6,431	1,002	6,413	716,600	12,900	1,725,000	447	191	51		26,300
1971	6,500	502	3,213	1,058,034	45,836	1,432,455	659	229	139		55,177
1972	7,418	1,005	6,249	1,002,395	83,960	1,495,922	497	147			85,278
1973	5,227	1,008	9,902	1,339,317	181,928	2,929,532	61	133		72	137,594
1974	6,660	603	21,074	1,062,666	58,816	3,879,300	381	56	57		208,842
1975	5,297	40	14,226	781,902	13,299	4,751,941	80	53	45	119	201,404
1976	3,921	80	11,375	1,398,779	29,778	4,256,679	93	92	72	10	226,893
1977	4,642	415	9,428	1,513,484	270,241	4,877,918	180	237	26	-	210,568
1978	5,711	74	9,340	1,473,354	168,241	8,639,156	222	117	7	75	261,422
1979	6,277	22	7,854	2,014,156	108,011	8,098,075	112	91	-	2	410,540
1980	8,764	130	15,783	3,341,262	56,295	8,781,062	29	18	-	37	579,927
1981	1,107	378	11,573	3,686,238	130,097	11,398,680	25	13	9	28	507,550
1982	-	7	751	2,790,456	246,500	4,992,877	-	19	-	1	584,053
1983	-	198	1,181	3,000,843	72,447	10,637,613	5	39	-	7	426,220
1984	-	5	1,768	2,426,205	590,526	5,516,532	-	36	-	16	468,244
1985	-	-	-	2,953,199	409,725	5,462,462	-	9	-	20 4/	476,024
1986	-	-	-	2,021,169	299,574	5,453,855	-	15	-	28 5/	2/

1/ Pack represents type of processing when fish were shipped out of district.
2/ Information not available.
3/ Includes aproximately 11,600 and 110,500 (round weight) of coho and chum salmon respectively, as salted fish for Japanese market.
4/ Also 13 half tierces of coho salmon packed.
5/ Also 2 half tierces of coho salmon packed.

Appendix Table 24. Dollar value estimates of Yukon area commercial salmon fishery, 1961-1986.

Year	Gross Value of Catch to Fishermen					Wholesale Value of Pack 1/	State Tax 2/ Revenues
	Chinook	Coho	Chum	Roe	Total		
1961	420,900	1,400	14,700	-	437,000	1,292,300	37,500
1962	330,300	11,500	20,100	-	361,900	1,275,250	50,400
1963	409,500	2,800	-	-	412,300	1,500,400	42,000
1964	351,000	1,200	2,200	-	354,400	1,203,800	35,000
1965	531,400	200	10,700	-	542,300	1,412,700	42,000
1966	419,900	9,600	25,000	-	454,500	1,308,100	37,000
1967	583,700	5,500	17,200	-	606,400	1,864,800	41,700
1968	494,300	6,700	34,000	-	535,000	1,655,200	47,000
1969	415,000	8,200	96,000	-	519,200	1,976,200	40,000
1970	401,300	10,300	211,500	-	623,100	2,113,100	45,000
1971	590,100	10,000	182,900	-	783,000	2,106,600	42,000
1972	547,800	20,400	215,800	-	784,000	2,405,200	45,300
1973	561,400	46,500	609,100	-	1,217,000	4,453,900	62,800
1974	881,300	28,400	1,011,300	-	1,921,000	6,035,900	84,100
1975	589,000	3,500	1,201,400	-	1,793,900	4,939,700	87,100
1976	983,500	8,600	1,158,900	-	2,151,000	6,815,500	96,900
1977	1,928,400	143,000	1,997,300	-	4,068,700	10,499,400	151,000
1978	2,133,700	79,200	3,101,800	-	5,314,700	14,194,800	179,400
1979	3,008,000	84,400	4,527,100	-	7,619,500	19,048,800	248,600
1980	3,639,300	21,800	2,676,800	365,200	6,703,100	16,757,700	205,400
1981	4,635,500	91,900	5,323,300	601,100	10,651,800	26,629,500	322,500
1982	3,871,300	153,700	2,693,800	422,500	7,141,300	17,853,250	222,000
1983	4,198,600	29,000	2,499,800	257,400	6,984,800	17,462,000	230,000
1984	3,620,400	268,800	1,498,000	301,800	5,689,000	14,222,500	194,000
1985	4,389,100	202,600	1,952,700	487,200	7,031,600	17,579,000	227,100
1986	3,238,500	212,500	2,232,400	565,400	6,248,800	15,622,000	203,086

1/ Based on type of processing when fish were shipped out of the area.
2/ Processors tax and vessel and crewmember license fees. Does not include CFEC permit fee.

Appendix Table 25. Estmated average prices paid to fishermen, Yukon area, 1961-1986.

PRICE PER FISH

Year	Lower Yukon Area Chinook	Lower Yukon Area Summer Chum	Lower Yukon Area Fall Chum	Lower Yukon Area Coho	Upper Yukon Area Chinook	Upper Yukon Area Summer Chum	Upper Yukon Area Fall Chum	Upper Yukon Area Coho
1961	$3.50							
1962	3.50							
1963	3.50							
1964	3.75		0.25	0.50				
1965	4.50		0.35					
1966	4.50		0.35	0.50				
1967	4.50	0.35	0.35	0.50				
1968	4.64	0.50	0.50	0.50				
1969	4.60	0.50	0.50	0.55				
1970	5.00	0.61	0.61	0.84				
1971	5.34	0.64	0.64	0.82				
1972	5.90	0.75	0.75	0.92				
1973	7.45	1.18	1.18	1.27				
1974	9.00	1.36	1.58	1.75	8.67	1.00	1.00	1.00
1975	9.24	1.30	1.50	1.51	16.25	1.12	1.12	1.12
1976	11.17	1.56	1.80	1.78	12.96	1.22	1.22	1.22
1977	20.32	2.80	3.60	3.75	24.17	1.75	1.75	1.75
1978	21.60	3.20	3.62	4.20	15.38	1.54	1.97	1.97
1979	22.74	3.87	5.05	5.87	20.20	1.65	2.24	2.24
1980	23.41	1.38	1.93	2.32	13.60	1.52	2.08	1.89
1981	29.76	3.00	4.40	4.08	23.70	1.42	2.59	2.00
1982	32.43	2.80	4.27	4.59	21.83	1.28	2.10	2.41
1983	28.70	2.45	2.69	2.45	20.63	1.06	1.46	1.86
1984	30.75	1.77	2.40	3.50	18.62	1.47	1.90	1.46
1985	30.45	2.35	3.62	3.92	15.82	1.40	1.88	2.11
1986	32.93	2.62	3.53	4.47	17.53	1.34	1.12	1.26

PRICE PER POUND

Year	Lower Yukon Area Chinook	Lower Yukon Area Summer Chum	Lower Yukon Area Fall Chum	Lower Yukon Area Coho	Upper Yukon Area Chinook	Upper Yukon Area Summer Chum	Upper Yukon Area Fall Chum	Upper Yukon Area Coho	Upper Yukon Area Roe
1964	0.17		0.03						
1965	0.20								
1966	0.20								
1967	0.19	0.05	0.05	0.07					
1968	0.18	0.06	0.06						
1969	0.19	0.08	0.08	0.08					
1970	0.22	0.09	0.09	0.12					
1971	0.24	0.10	0.10	0.12					
1972	0.24	0.11	0.11	0.13					
1973	0.30	0.16	0.16	0.18					
1974	0.38	0.21	0.21	0.25	0.50	0.15	0.13	0.15	0.75
1975	0.42	0.20	0.20	0.21	0.92	0.17	0.14	0.17	1.16
1976	0.51	0.24	0.24	0.27	0.74	0.19	0.16	0.19	1.33
1977	0.85	0.40	0.45	0.50	1.37	0.27	0.22	0.27	2.66
1978	0.90	0.45	0.47	0.60	0.87	0.24	0.25	0.24	1/
1979	1.09	0.52	0.68	0.80	1.00	0.25	0.29	0.25	3.00
1980	1.04	0.20	0.28	0.36	0.85	0.23	0.27	0.29	2.50
1981	1.20	0.40	0.55	0.60	1.00	0.20	0.35	0.35	3.00
1982	1.41	0.40	0.55	0.69	1.02	0.18	0.28	0.37	2.75
1983	1.40	0.34	0.34	0.35	1.08	0.16	0.19	0.31	1.66
1984	1.50	0.26	0.32	0.50	0.95	0.23	0.26	0.24	1.78
1985	1.50	0.35	0.47	0.53	0.86	0.23	0.25	0.33	1.94
1986	1.63	0.38	0.49	0.71	0.89	0.22	0.14	0.21	2.08

1/ Data unavailable.

Appendix Table 26. Average weight of salmon, commercial catch, Yukon area, 1964-1986.

	AVERAGE WEIGHT IN POUNDS 1/							
	Lower Yukon Area				Upper Yukon Area			
Year	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho
1964	22.6	-	-	-				
1965	23.0	-	-	-				
1966	23.0	-	-	-				
1967	24.0	-	-	7.3				
1968	26.5	-	-	-				
1969	23.9	-	-	6.7				
1970	22.3	-	-	7.1				
1971	22.6	-	-	6.9				
1972	24.6	6.6	7.6	7.1				
1973	24.5	6.8	7.9	7.1				
1974	23.7	6.5	7.5	7.0	17.3	6.7	7.7	6.7
1975	22.0	6.5	7.5	7.2	17.7	6.6	8.0	6.6
1976	21.9	6.5	7.5	6.6	18.4	6.4	8.0	7.5
1977	23.9	7.0	8.0	7.5	17.6	6.5	8.0	6.5
1978	24.0	7.1	7.7	7.0	20.2	6.8	7.4	6.4
1979	20.9	7.4	7.4	7.3	20.2	6.6	7.7	6.5
1980	22.5	6.9	6.9	6.4	16.0	6.6	7.7	6.5
1981	24.8	7.5	8.0	6.8	23.7	7.1	7.4	5.7
1982	23.0	7.1	7.7	6.7	21.4	7.1	7.5	6.5
1983	20.5	7.2	7.9	7.0	19.1	6.6	7.7	6.0
1984	20.5	6.8	7.5	7.0	19.6	6.4	7.3	6.1
1985	20.3	6.7	7.7	7.4	18.4	6.1	7.5	6.4
1986	20.2	6.9	7.2	6.3	19.7	6.1	8.0	6.0

1/ Information not available for some species. Data obtained from age-length-weight samples or fish ticket entries.

Appendix Table 27. Yukon River chinook salmon subsistence catches by village, 1973-1986. 1/

Village	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Mouth to Anuk River														
Sheldon's Point	165	283	108	122	302	546	91	427	163	79	1,021	802	143	592
Alakanuk	461	569	130	363	213	1,125	893	1,595	423	336	1,582	1,028	517	1,027
Emmonak-Kwiguk	1,071	208	55	398	62	2,738	1,362	1,175	1,021	1,328	2,436	2,099	1,382	1,754
Kotlik-Hamilton	1,114	399	204	472	173	837	533	472	675	568	1,224	695	1,029	1,902
Subtotal	2,811	1,459	497	1,355	750	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275
Anuk River to Owl Slough														
Mountain Village	912	460	394	397	172	817	1,025	843	811	218	1,875	1,217	672	1,367
Pitka's Point-St. Mary's	1,270	878	438	1,273	576	1,314	1,718	1,297	1,380	985	2,432	2,663	778	1,717
Pilot Station	1,508	517	107	502	556	1,027	804	433	399	428	2,703	1,116	896	1,452
Marshall	1,163	1,068	436	694	364	806	721	1,101	990	478	2,055	2,176	1,122	1,947
Subtotal	4,853	2,923	1,375	2,866	1,668	3,964	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483
Owl Slough to Bonasila R.														
Russian Mission	1,387	1,243	2,098	1,328	639	1,498	1,476	1,660	1,689	1,628	2,634	1,938	974	1,747
Holy Cross	3,708	2,243	2,792	1,492	1,920	2,404	1,787	3,123	2,312	1,731	2,276	2,456	2,368	2,505
Subtotal	5,095	3,486	4,890	2,820	2,559	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252
Bonasila R. to Illinois Ck.														
Anvik	67	111	83	84	67	180	261	161	191	354	744	576	405	959
Grayling 2/	516	547	100	117 2/	149	292	391	3,664	222	294	951	879	903	1,890
Kaltag	148	616	192	57	216	127	435	694	179	344	652	487	669	1,080
Nulato	307	1,161	1,119	968	1,531	1,354	1,245	2,297	1,117	811	1,135	966	1,063	1,835
Koyukuk	564	604	50	437	752	518	495	699	541	493	966	1,099	194	569
Galena	510	706	1,294	435	1,155	945	1,591	1,205	570	735	1,477	1,226	1,329	1,046
Ruby-Kokrines	2,418	2,899	912	1,959	735	1,539	2,221	1,736	964	1,168	2,346	1,107	1,657	1,263
Subtotal	4,530	6,644	3,750	4,057	4,605	4,955	6,639	10,456	3,784	4,199	8,271	6,340	6,220	8,642

(Continued)

Appendix Table 27. Yukon River chinook salmon subsistence catches by village, 1973-1986. 1/ (Continued)

Village	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Illinois Cr. to U.S./Canada Border														
Tanana	965	789	80	1,338	858	1,851	1,604	5,711	2,517	2,230	5,547	2,682	1,248	1,672
Rampart	2,614	452	517	581	1,194	987	1,820	1,169	488	887	1,070	876	1,302	1,700
Steven's Village	1,027 3/	590	362	643 6/	1,252 6/	3,178	2,194 6/	3,962 6/	2,387 6/	3,745 6/	5,203 6/	4,676 6/	4,628 6/	4,601 6/
Beaver	358	34	168	188	299	558	394	506	552	250	220	553	506	708
Fort Yukon	536	1,030	215	1,158	1,061	2,642	1,922	2,527	2,794	1,894	1,887	3,608	2,900	3,083
Circle	225	406	16	528	304	212	1,175	769	728	969	648	545	2,259	2,219
Eagle	421	66	20	633	1,171	963	2,888	2,880	3,782	2,864	2,183	1,998	2,247	1,973
Subtotal	6,146	3,367	1,378	5,069	6,139	10,391	11,997	17,524	13,248	12,839	16,758	14,938	15,090	15,956
Innoko River														
Shageluk	-	-	-	11	-	-	62	35	10	-	-	-	-	-
Subtotal	-	-	-	11	-	-	62	35	10	-	-	-	-	-
Koyukuk River														
Huslia	35	69	23	21	50	132	146	154	61	125	459	169	144	82
Hughes	32	10	25	155	72	216	180	226	402	479	318	856	778	296
Alatna	1	17	0	0	1	7	2	20	0	6	6	2	-	-
Allakaket	73	138	151	231	172	239	236	197	185	268	700	373	283	563
Subtotal	141	234	199	407	295	594	564	597	648	878	1,483	1,400	1,205	941
Tanana River														
Minto-Manley Hot Springs	58	176	213	326	752	298	269	764	711	797	1,265	722	2,130	971
Nenana	683	1,431	533	864	742	807	800	771	974	1,195	966	2,556	4,919	2,093
Fairbanks	26	38	32	31	67	126	264	291	400	451	475	321	326	637
Subtotal	767	1,645	778	1,221	1,561	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701

(Continued)

Appendix Table 27. Yukon River chinook salmon subsistence catches by village, 1973-1986. 1/ (Continued)

Village	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Chandalar River														
Venetie	-	-	-	-	-	9	-	160	52	20	22	51	-	32
Subtotal	-	-	-	-	-	9	-	160	52	20	22	51	-	32
Yukon Territory Villages														
Old Crow (Porcupine R.)	4	75	100	25	29	-	100	-	100	400	200	500	150	300
Dawson	-	-	-	500	531	421	1,200	-	1,016	20	-	-	-	-
Stewart River	99	-	-	-	-	-	-	-	1,000	62	-	-	-	-
Mayo-Sewart Crossing	25	233	-	-	61	105	-	-	-	720	-	-	-	-
Fraser Falls	25	-	-	-	-	-	-	-	-	-	-	-	-	-
Durwash-Kluane River	-	-	-	-	-	-	-	-	-	0	-	-	-	-
Fort Selkirk	45	-	-	-	-	-	-	-	-	164	-	-	-	-
Pelly	53	433	-	200	265	500	-	-	-	3,142	-	-	-	-
Faro	75	-	-	-	-	-	-	-	3,286	-	-	-	-	-
Ross River	75	30	-	-	-	-	-	-	-	440	-	-	-	-
Minto	261	-	-	-	-	-	-	-	400	-	-	-	-	-
Tatchun Creek	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carmacks	1,384	2,563	-	800	1,121	1,280	3,000	-	-	3,172	-	-	-	-
Lake Labarge-Whitehorse	-	-	-	-	-	-	-	-	3,042	7	-	-	-	-
Takhini	-	-	-	-	-	-	-	-	-	-	-	-	-	-
McClintock River	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carcross	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Teslin-Johnson's Crossing	54	20	-	-	800	600	-	-	-	500	-	-	-	-
Subtotal 4/	2,323	3,823	3,000 5/	1,525	2,807	2,906	4,300	13,046 5/	9,216	8,627	5,625 5/	6,610 5/	6,428 5/	9,267 5/
Total	26,666	23,581	15,867	19,331	20,384	33,198	35,305	55,770	38,906	36,785	55,103	49,128	46,199	54,549

1/ 1961-1972 data available from 1981 Yukon Area Annual Management Report.
2/ Includes Shageluk catches.
3/ Includes New Minto fish camp catches.
4/ Data by village obtained from annual management reports. Subtotals include revised catch data and summation of village catches may not equal subtotal.
5/ Catch by village not available.
6/ Includes catches made by Fairbanks permit holders who fished in Yukon River near bridge crossing.

Appendix Table 28. Subsistence and commercial chinook salmon catches by district and country, Yukon River drainage, 1978-1986.

	1978	1979	1980	1981	1982	1983	1984	1985	1986
District 1									
Subsistence	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275
Commercial	59,006	75,007	90,382	99,506	74,450	95,457	74,671	90,011	53,035
Subtotal	64,252	77,886	94,051	101,788	76,761	101,720	79,295	93,082	58,310
District 2									
Subsistence	3,964	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483
Commercial	32,924	41,498	50,004	45,781	39,132	43,229	36,697	48,365	41,849
Subtotal	36,888	45,766	53,678	49,361	41,241	52,294	43,869	51,833	48,332
District 3									
Subsistence	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252
Commercial	2,916	5,018	5,240	4,023	2,609	4,106	3,039	2,588	901
Subtotal	6,818	8,281	10,023	8,024	5,968	9,016	7,433	5,930	5,153
Lower Yukon Total									
Subsistence	13,112	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010
Commercial	94,846	121,523	145,626	149,310	116,191	142,792	114,407	140,964	95,785
Total	107,958	131,933	157,752	159,173	123,970	163,030	130,597	150,845	111,795
District 4									
Subsistence a/	5,549	7,265	11,088	4,442	5,077	9,754	7,650	7,425	9,583
Commercial	608	1,989	1,521	1,347	1,087	601	961	664	502
Subtotal	6,157	9,254	12,609	5,789	6,164	10,355	8,611	8,089	10,085
District 5									
Subsistence b/	10,405	11,997	17,684	13,300	12,859	16,780	14,989	15,090	15,9[illegible]
Commercial	3,079	3,389	4,891	6,374	5,385	3,606	3,669	3,418	2,733
Subtotal	13,484	15,386	22,575	19,674	18,244	20,386	18,658	18,508	18,[illegible]
District 6									
Subsistence	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701
Commercial	635	772	1,947	987	981	911	867	1,142	950
Subtotal	1,866	2,105	3,773	3,072	3,424	3,617	4,466	8,517	4,651
Upper Yukon Total									
Subsistence	17,185	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,2[illegible]
Commercial	4,322	6,150	8,359	8,708	7,453	5,118	5,497	5,224	4,185
Total	21,507	26,745	38,957	28,535	27,832	34,358	31,735	35,114	33,4[illegible]
Alaska Totals									
Subsistence	30,297	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,2[illegible]
Commercial	99,168	127,673	153,985	158,018	123,644	147,910	119,904	146,188	99,970
Total	129,465	158,678	196,709	187,708	151,802	197,388	162,332	185,959	145,2[illegible]
Canada									
Subsistence	2,906	4,200	13,046	9,216	8,268	5,625	6,610	6,428	9,267
Commercial	2,975	6,175	9,500	8,593	8,640	13,027	9,885	12,573	10,797
Total	5,881	10,375	22,546	17,809	16,908	18,652	16,495	19,001	20,064
U.S./Canada Totals									
Subsistence	33,203	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,5[illegible]05
Commercial	102,143	133,848	163,485	166,611	132,284	160,937	129,789	158,761	110,767
Totals	135,346	169,053	219,255	205,517	168,710	216,040	178,827	204,960	165,[illegible]272

a/ Includes Innoko and Koyukuk River drainages.
b/ Includes Chandalar and Black River drainages.

Appendix Table 29. Subsistence and commercial summer chum salmon catches by district, Yukon area, 1978-1986.

	1978	1979	1980	1981	1982	1983	1984	1985	1986
District 1									
Subsistence	30,897	16,144	15,972	11,310	18,452	24,679	28,459	24,349	38,854
Commercial	393,785	369,934	391,252	507,158	249,516	451,164	292,676	247,486	381,127
Subtotal	424,682	386,078	407,224	518,468	267,968	475,843	321,135	271,835	419,981
District 2									
Subsistence	21,684	23,276	13,681	14,218	18,442	27,396	26,996	19,795	41,496
Commercial	227,548	172,838	308,704	351,878	182,344	248,092	236,931	188,099	288,427
Subtotal	249,232	196,114	322,385	366,096	200,786	275,488	263,927	207,894	329,923
District 3									
Subsistence	1,706	2,946	3,242	4,929	5,840	4,609	7,351	3,687	5,528
Commercial	27,003	40,015	44,782	54,471	4,086	14,600	1,087	1,792	442
Subtotal	28,709	42,961	48,024	59,400	9,926	19,209	8,438	5,479	5,970
Lower Yukon Total									
Subsistence	54,287	42,366	32,895	30,457	42,734	56,684	62,806	47,831	85,878
Commercial	648,336	582,787	744,738	913,507	435,946	713,856	530,694	437,377	669,996
Total	702,623	625,153	777,633	943,964	478,680	770,540	593,500	485,208	755,874
District 4									
Subsistence 1/	110,052	123,740	221,201	139,572	199,985	136,045	112,965	165,383	166,072
Commercial 2/	381,104	204,747	234,837	241,826	120,513	166,056	221,964	321,939	359,193
Subtotal	491,156	328,487	456,038	381,398	320,498	302,101	334,929	487,322	525,265
District 5									
Subsistence	21,028	23,878	8,594	27,308	9,791	23,943	31,535	26,996	21,889
Commercial 3/	4,892	8,608	456	1,236	234	42	645	700	690
Subtotal	25,920	32,486	9,050	28,544	10,025	23,985	32,180	27,696	22,579
District 6									
Subsistence	11,770	6,203	9,708	10,947	8,459	23,714	23,441	24,618	17,049
Commercial 3/	34,814	18,491	35,855	32,477	21,597	24,309	56,249	66,913	50,483
Subtotal	46,584	24,694	45,563	43,424	30,056	48,023	79,690	91,531	67,532
Total Upper Yukon									
Subsistence	142,850	153,821	239,503	177,827	218,235	183,702	167,941	216,997	205,010
Commercial	420,810	231,846	271,148	275,539	142,344	190,407	278,858	389,552	410,366
Total	563,660	385,667	510,651	453,366	360,579	374,109	446,799	606,549	615,376
Alaska Total									
Subsistence	197,137	196,187	272,398	208,284	260,969	240,386	230,747	264,828	290,888
Commercial	1,069,146	814,633	1,015,886	1,189,046	578,290	904,263	809,552	826,929	1,080,362
Total	1,266,283	1,010,820	1,288,284	1,397,330	839,259	1,144,649	1,040,299	1,091,757	1,371,250

1/ Includes Koyukuk and Innoko River drainages.
2/ In 1986, 80.2% of the reported subsistence harvest in District 4 (excluding Koyukuk and Innoko River catches) was estimated to have been taken during commercial fishing activities. This relationship was used to adjust total estimated commercial related harvests in Appendix Table 6 for 1980-1986.
3/ Harvest of females for commercial roe sales believed to be reported as subsistence.

Note changes for 1986 in Table 14.

Appendix Table 30. Subsistence and commercial fall chum salmon catches by district and country, Yukon River drainage, 1978-1986.

	1978	1979	1980	1981	1982	1983	1984	1985	1986
District 1									
Subsistence	390	15,788	7,433	15,540	10,016	8,238	8,885	13,275	9,000
Commercial	127,947	109,406	106,829	167,834	97,484	124,371	78,751	129,948	59,352
Subtotal	128,337	125,194	114,262	183,374	107,500	132,609	87,636	143,223	68,352
District 2									
Subsistence	1,297	14,662	12,435	11,770	9,511	10,341	11,394	11,544	13,483
Commercial	51,646	94,042	83,881	154,883	96,581	85,645	70,803	40,490	51,307
Subtotal	52,943	108,704	96,316	166,653	106,092	95,986	82,197	52,034	64,790
District 3									
Subsistence	266	2,443	2,320	2,893	1,659	2,863	2,233	2,290	1,785
Commercial	11,527	25,955	13,519	19,043	5,815	10,018	6,429	5,164	2,793
Subtotal	11,793	28,398	15,839	21,936	7,474	12,881	8,662	7,454	4,578
Lower Yukon Total									
Subsistence	1,953	32,893	22,188	30,203	21,186	21,442	22,512	27,109	24,268
Commercial	191,120	229,403	204,229	341,760	199,880	220,034	155,983	175,602	113,452
Total	193,073	262,296	226,417	371,963	221,066	241,476	178,495	202,711	137,720
District 4									
Subsistence a/	10,652	37,896	23,675	20,123	20,319	34,209	31,152	25,275	26,496
Commercial c/	10,988	48,899	27,978	12,082	3,894	4,482	7,625	24,452	2,045
Subtotal	21,640	86,795	51,653	32,205	24,213	38,691	38,777	49,727	28,541
District 5									
Subsistence b/	51,705	110,792	76,466	111,567	71,828	105,105	98,433	117,125	88,117
Commercial c/	21,016	47,459	41,771	86,620	13,593	43,993	24,060	25,338	22,053
Subtotal	72,721	158,251	118,237	198,187	85,421	149,098	122,493	142,463	110,170
District 6									
Subsistence	30,557	51,766	50,328	26,632	19,564	32,174	22,726	36,963	25,153
Commercial c/	13,259	34,185	19,452	25,989	6,820	34,089	20,564	42,352	1,892
Subtotal	43,816	85,951	69,780	52,621	26,384	66,263	43,290	79,315	27,045
Upper Yukon Total									
Subsistence	92,914	200,454	150,469	158,322	111,711	171,488	152,311	179,363	139,766
Commercial	45,263	130,543	89,201	124,691	24,307	82,564	52,249	92,142	25,990
Total	138,177	330,997	239,670	283,013	136,018	254,052	204,560	271,505	165,756
Alaska Totals									
Subsistence	94,867	233,347	172,657	188,525	132,897	192,930	174,823	206,472	164,034
Commercial	236,383	359,946	293,430	466,451	224,187	302,598	208,232	267,744	139,442
Total	331,250	593,293	466,087	654,976	357,084	495,528	383,055	474,216	303,476
Canada Totals									
Subsistence d/	6,210	13,000	13,218	7,021	4,779	3,500	6,335	5,519	3,372
Commercial	3,356	9,084	9,000	15,260	11,312	25,990	22,932	35,746	11,464
Total	9,566	22,084	22,218	22,281	16,091	29,490	29,267	41,265	14,836
Yukon River drainage Totals									
Subsistence	101,077	246,347	185,875	195,546	137,676	196,430	181,158	211,991	167,406
Commercial	239,739	369,030	302,430	481,711	235,499	328,588	231,164	303,490	150,906
Total	340,816	615,377	488,305	677,257	373,175	525,018	412,322	515,481	318,312

a/ Includes Innoko and Koyukuk River drainages..
b/ Includes Chandalar and Black River drainages.
c/ Harvest of females for commercial roe sales believed to be reported as subsistence.
d/ Includes small numbers of coho salmon taken at Old Crow.

Note changes in 1985 in Table 14.

Appendix Table 31. Subsistence and commercial coho salmon catches by district, Yukon area, 1978-1986.

	1978	1979	1980	1981	1982	1983	1984	1985	1986
District 1									
Subsistence	1,142	3,184	1,808	3,769	11,192	3,590	6,095	3,246	2,725
Commercial	16,460	11,369	4,829	13,129	15,115	4,595	29,472	27,676	24,824
Subtotal	17,602	14,553	6,637	16,898	26,307	8,185	35,567	30,922	27,549
District 2									
Subsistence	598	1,132	4,801	3,736	10,229	6,072	7,066	4,834	9,140
Commercial	5,835	2,850	2,660	7,848	14,179	2,557	43,064	17,125	21,197
Subtotal	6,433	3,982	7,461	11,584	24,408	8,629	50,130	21,959	30,337
District 3									
Subsistence	233	12	91	490	675	917	740	376	781
Commercial	758	0	0	419	87	0	621	171	793
Subtotal	991	12	91	909	762	917	1,361	547	1,574
Lower Yukon Total									
Subsistence	1,973	4,328	6,700	7,995	22,096	10,579	13,901	8,456	12,646
Commercial	23,053	14,219	7,489	21,396	29,381	7,152	73,157	44,972	46,814
Total	25,026	18,547	14,189	29,391	51,477	17,731	87,058	53,428	59,460
District 4									
Subsistence a/	145	259	7,734	2,259	2,952	3,946	2,867	3,949	2,631
Commercial	32	155	30	0	15	0	1,095	938	0
Subtotal	177	414	7,764	2,259	2,967	3,946	3,962	4,887	2,631
District 5									
Subsistence b/	970	595	561	1,713	3,428	2,448	17,467	8,098	5,870
Commercial	1	0	0	0	0	0	0	0	0
Subtotal	971	595	561	1,713	3,428	2,448	17,467	8,098	5,870
District 6									
Subsistence	4,709	4,612	5,163	9,261	7,418	6,922	14,785	11,761	13,323
Commercial	3,066	2,791	1,226	2,284	7,780	6,168	7,688	11,762	441
Subtotal	7,775	7,403	6,389	11,545	15,198	13,090	22,473	23,523	13,764
Upper Yukon Total									
Subsistence	5,824	5,466	13,458	13,233	13,798	13,316	35,119	23,808	21,824
Commercial	3,099	2,946	1,256	2,284	7,795	6,168	8,783	12,700	441
Total	8,923	8,412	14,714	15,517	21,593	19,484	43,902	36,508	22,265
Area Total									
Subsistence c/	7,797	9,794	20,158	21,228	35,894	23,895	49,020	32,264	34,470
Commercial	26,152	17,165	8,745	23,680	37,176	13,320	81,940	57,672	47,255
Total	33,949	26,959	28,903	44,908	73,070	37,215	130,960	89,936	81,725

a/ Includes Innoko and Koyukuk River drainages.
b/ Includes Chandalar and Black River drainages.
c/ Small numbers of coho salmon taken at Old Crow in Canada are included with fall chum catches.

Note changes for 1986 in Table 14.

Appendix Table 32. Subsistence salmon catches taken under authority of a permit, upper Yukon area, 1973-1986.

Upper Tanana River (upstream of Wood River) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches	Chinook	Summer Chum	Fall Chum and coho
1973	22	4	26	771	886
1974	70	1/	38	1,373	1,580
1975	36	1/	32	751	864
1976	110	1/	31	1,314	1,512
1977	89	33	81	118	607
1978	160	126	126	2,729	1,188
1979	246	199	264	2,384	4,459
1980	315	254	282	3,729	4,059
1981	346	228	440	3,239	5,770
1982	330	209	451	2,708	4,521
1983	259	147	475	2,276	3,830
1984	308	212	321	3,177	5,134
1985	291	155	326	2,646	3,937
1986	323	211	637	4,031	4,437

Upper Tanana River (Big Delta area) subsistence chum salmon carcass fishery

Year	No. of Permits Issued	No. Reporting Catches	Fall Chum Carcasses
1973	16	8	1,561
1974	21	1/	1,974
1975	26	1/	2,573
1976	36	1/	3,441
1977	46	29	5,816
1978	70	43	2,517
1979	32	25	4,582
1980	57	36	4,915
1981	43	27	5,030
1982	37	13	1,690
1983	45	29	5,357
1984	31	14	2,353
1985	30	14	2,111
1986	27	19	2,276

Upper Yukon River (Hess Creek to Dall River) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches	Chinook	Chum	Coho
1974	29	1/	591	1,857	1,271
1975	19	1/	727	778	70
1976	28	18	531	974	-
1977	38	1/	467	2,567	-
1978	57	1/	1,333	9,735	-
1979	55	41	2,194	12,374	-
1980	70	67	1,350	6,488	36
1981	57	24	1,095	12,034	-
1982	64	44	1,935	11,328	20
1983	68	46	2,672	15,059	-
1984	67	54	4,676	27,869	399
1985	55	42	2,618	21,832	33
1986	76	48	1,762	13,090	709

Upper Yukon R. (22 Mi Slough to U.S./Canada border) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches	Chinook	Chum	Coho
1979	75	60	4,063	30,475	114
1980	48	39	3,649	18,477	6
1981	71	51	4,510	38,333	-
1982	60	61	3,833	15,432	-
1983	53	52	2,831	23,708	-
1984	58	54	2,543	21,675	17
1985	59	36	2,419	19,059	2
1986	40	52	4,192	20,701	43

1/ Information not available.

Appendix Table 33. Comparative Yukon River chinook salmon escapement estimates, 1972-1986. a

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Andreafsky River															
East Fork	798	825	--	993	818	2,008	2,487	1,180	958 b	2,146 c	1,274	2,720 d	2,473 d	1,617	1,954
West Fork	582 b	788	285	301	643	1,499	1,062	1,134	1,500	231 b	851	--	1,993	2,248	3,158
Total	1,380	1,613	285 b	1,294	1,461	3,507	3,549	2,314	2,458	2,377 b	2,125	2,720 b	4,466	3,865	5,112
Anvik River Drainage															
Tower Count	1,104	517	471	548	958	1,261	1,088	1,247	--	--	--	--	--	--	--
Below Tower Site (incl trib)	94 e	96 b	--	182 e	195 e,f	110	236	237	--	--	--	--	--	--	--
Total	1,198	613	471 b	730	1,153	1,371	1,324	1,484	1,330	807 b	--	653 b	641 b	1,051	1,118
Nulato River															
North Fork (incl main river)	--	--	55 b	123	471	286	498	1,093	954	--	--	526	--	1,600	1,452
South Fork	--	--	23 b	81	177	201	422	414	369	791	--	480	--	1,180	1,522
Total	--	--	78 b	204	648	487	920	1,507	1,323	791 b	--	1,006 b	--	2,780	2,974
Gisasa River	--	--	161	385	332	255	45 b	484	951	--	421	572	--	735	1,346
Tositna River	--	--	--	202	42 b	123	194	--	257	--	51	388	--	86	222
Chena River	138 b,e	21	1,035 e	316 e	531	563	1,726	1,159	2,541	600 b	2,079	2,553	501	2,553	2,031 g
Salcha River	1,193	391	1,857	1,055	1,641	1,202	3,499	4,789	6,757	1,237 b	2,534	1,961	1,031	2,035	3,368
Tatchun Creek h,i	80	99 j	192 j	175 j	52 j	150 j	200 e,j	150 j	222 j	133 j	73 j	264 j	161	190	155 j
Little Salmon River h	126	27 b	--	--	--	171	330	489 b	286 b	670	403	101 b	434	255 j	54 b,j
Big Salmon River h															
Big Salmon Lk - Scurvy Cr	112	23 b	--	153	--	--	--	555	470	930	174	189	228	202	306
Scurvy Cr - vicinity Souch Cr	303 j	52 b	--	--	--	--	--	77	966	1,481	584	351	816	599	439
Total	415	75 b	70 b	153 b	86 b	316 b	524 b	632	1,436	2,411	758	540	1,044	801	745 k
Nisutlin River Drainage h															
Sidney Cr - 100 Mile Cr	237	36 b		249	102	77	375	713	975	1,626	578	701	832	409	459 b
McNeil Ri - Nisutlin Lk	48	6 b		88	50	--	109	--	400	168	97	107	222	96	148
Wolf Ri (Wolf Lk - Red Ri)	13 j	--	--	40 b,j	--	--	--	183 b	377 j	395	104	95	124	110	109
Total	298	42 b	150 b,j	377 b	152 b	77 b	484 b	896 b	1,752	2,189	779	903	1,178	615	716
Whitehorse Dam (Fishway Counts) h	391	224	273	313	121	277	725	1,184	1,383	1,539	473	905	1,042 l	508 m	557 n
Canadian Yukon Mainstem (Tagging)	--	--	--	--	--	--	--	--	--	--	20,200 o	29,500 o	--	10,800 o	17,500 o

a Data obtained from aerial surveys unless otherwise indicated. Only peak estimates are listed.
b Incomplete or poor survey conditions resulting in a very minimal count.
c Bendix sonar estimate was 5,343.
d Bendix side scan sonar estimate.
e Boat survey.
f Also includes 93 chinook observed in the Yellow River.
g Peterson population estimate was ??.
h Yukon Territory streams.
i Foot survey.
j Canadian (DFO) data.
k The DFO weir count was 1,816 kings.
l Includes 65 chinook taken for hatchery brood stock
m Includes 98 chinook taken for hatchery brood stock
n Includes 150 chinook taken for hatchery brood stock of which 90 died.
o Estimated total escapement to Canada (excluding Porcupine R.) from DFO tagging project.

Table 34. Comparative Yukon River summer chum salmon escapement estimates 1974-1986. a

		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Andreafsky River														
East Fork		3,215 b	223,485	105,347	112,722	127,050	66,471	36,823 b	81,555 c	7,501 b,d	110,608 e	70,125 e	66,146	167,614 f
West Fork		33,578	235,954	118,420	63,120	57,321	43,391	115,457	--	7,267	--	238,565	52,750	99,373
	Total	36,793 b	459,439	223,767	175,842	184,371	109,862	152,280	--	14,768 b	--	308,690	118,896	266,987
Anvik River Drainage														
Tower Count		201,277	601,880	237,851	162,614	166,102	37,457	--	--	--	--	--	--	--
Below Tower Site g			211,130	168,315	100,240	85,237	--	--	--	--	--	--	--	--
Above Tower Site g			634,355	243,695	--		84,620	--	--	--	--	--	--	--
	Subtotal	--	845,485	412,010	100,240	85,237	--	--	--	--	--	--	--	--
	Total	201,277 b	845,485	406,166	262,854	251,339	280,537 e,h	492,676 e	1,479,582 e	444,581 e	362,912 e	891,028 e	1,080,243 e	1,189,602 e
Rodo River		16,137	25,335	38,258	16,118	17,845	--	--	--	--	--	--	24,576	--
Nulato River														
North Fork (incl main river)		22,144	27,280	30,771	58,275	41,659	35,598	11,244 b	--	--	19,749	--	19,344	47,417
South Fork		29,016	51,215	9,230 b	11,385	12,821	1,506	3,702 b	14,348	--	1,263 i	--	10,494	16,848
(best estimate)	Total	51,160	78,495	40,001	69,660	54,480	37,104	14,946 b	--	--	21,012 b	--	29,838	64,265
Gisasa River		22,022	56,904	21,342	2,204 b	9,280 b	10,962	10,388	--	334 j	2,356 b	--	13,232	12,114
Hogatza River														
Clear Creek		--	7,610	9,356	6,437	2,716	5,132	12,375	--	4,198 j	14,051	--	8,072	--
Caribou Creek		--	14,745	11,388	4,297	2,386	9,089	7,411	--	786 j	14,090	--	14,494	--
	Total	--	22,355	20,744	10,734	5,102	14,221	19,786	--	4,984 b	28,141	--	22,566	--
Tozitna River		1,823	3,512	725 b	761	2,262	--	580	--	874	1,604	--	1,030	1,778
Chena River		4,349 k	2,380 k	685	610	1,609	1,025 b	338	3,500	1,509	1,097	1,861	1,005	1,509
Salcha River		3,510	7,573	6,484	677	5,405	3,060	4,140	8,500	3,756	716	9,810	3,178	8,028

a Data are peak aerial survey estimates rated fair to good unless indicated otherwise.
b Incomplete or poor survey conditions resulting in minimal count.
c Sonar estimate was 147,312.
d Sonar estimate was 180,078.
e Bendix side scan sonar estimate.
f Tower count.
g Includes tributaries
h Count includes 277,712 sonar estimate plus 2,825 below sonar site.
i Surveyed too early.
j Surveyed too late.
k Boat survey.

Table 35. Comparative Yukon River fall chum salmon escapement estimates to selected index areas, 1973-1986. a

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
TANANA RIVER DRAINAGE														
Upper Toklat River b	6,957	34,310	42,418 c	35,190	21,800 c	35,000	96,550 d	23,054	13,907	3,309 e	15,105 e	15,861	21,824 d	12,708 d
Lower Toklat River	--	--	35,867 c	(2,000) d	--	--	64,540	(2,140)	--	--	--	--	--	--
Upper Tanana River														
Benchmark #735 Slough	127	1,450 c	--	336	1,270	1,705 c	2,714	1,900 e	168 c	--	--	--	1,093	--
Delta River	7,971 f	4,010	3,734 h	6,312 h	16,876 h	10,051	8,125	4,637	22,375 e,g	3,433 e	7,230 e	12,327 e	17,276 h	6,703 h
South Bank Tanana i	5,635	4,567 f	--	4,979	3,797	5,700	20,820	3,444	7,063	--	1,350 c	2,150	975 c	1,610 c
Bluff Cabin Slough	3,450	4,840 f	5,000 c,d	3,197	6,491	5,340	6,875	3,190	6,120	1,156 e	12,715 e	4,017 e	2,655	3,458 e
One Mile Slough	1,720	1,235	745 d	1,552	1,900	475	3,850 c	885 c	632	--	1,115 c	560 c	366 c	1,949
Subtotal	18,903	16,102	9,479 j	16,376	30,334	23,271	42,384	14,056	36,358	4,589 j	22,410 j	19,054 j	22,365	13,720 j
Total Tanana Index	25,860	50,412	87,764 j	51,566	52,134	58,271	203,474	37,110	50,265	7,898 j	37,515 j	34,915 j	44,189	26,428
PORCUPINE RIVER DRAINAGE														
Sheenjek River	1,175 f,k	40,507	78,060	11,866	20,506	14,610 c	41,140	13,027	74,560 l	31,421 l	49,392 l	27,130 l	152,768 l	83,197 l
Fishing Branch River (YT)	15,987 m	31,525 m	353,282 m	13,450	32,500	15,000	44,080	20,319 c	10,549 j	5,846	10,000	5,570	56,016 m	31,173 m,r
Total Porcupine River	17,162 n	72,032 n	431,342 n	25,316	53,006	29,610	85,220	33,346	85,109 n	37,267 n	59,392 n	32,700 n	208,784 n	114,370 n
UPPER YUKON TRIBUTARIES														
Chandalar River	--	17,455	6,345 c,j	58 c,j	4,183	--	--	2,607	4,906 o,j	1,145 o	--	--	2,535 p	59,313 p,l
Kluane River (YT)	2,500	350 j	362 e,f	20 f	3,555	0 f	4,640 e	3,150	25,806	5,378 e	8,578 e,j	7,200	7,538	16,686
Yukon River (YT) q	--	--	7,671	--	--	--	--	--	250 j	1,020	7,560	2,800	10,760	825
MAINSTEM YUKON CANADA (Tagging)	--	--	--	--	--	--	--	--	--	34,000 s	89,000 s	--	59,000 s	88,000 s

a Data are peak aerial survey estimates rated fair to good unless otherwise indicated.
b Includes following areas: Toklat River in vicinity of Knights Roadhouse; Sushana River; Geiger Creek. Lower Toklat River counts are included in Total Tanana River Index for years 1975 and 1979.
c Poor survey.
d Combined aerial and ground surveys.
e Ground surveys.
f Survey rating not given.
g Peak aerial count was 10,664.
h Population estimate based upon replicate ground surveys.
i Richardson Highway to Blue Creek
j Incomplete, partial survey of index area(s).
k Surveyed too early.
l Bendix side scan sonar estimate. (For Sheenjek River -- includes expansion for uninsonified mid-river zone).
m Weir counts.
n Figure includes sonar or weir estimate and is not comparable on a year to year basis.
o Fair to poor survey rating.
p USFWS estimates.
q Vicinity of Ft Selkirk to Carmacks.
r Preliminary figure.
s Estimated total escapement to Canada (excluding Porcupine R.) from DFO tagging project.

Appendix Table 36. Yukon River fall chum salmon harvest, escapement to four selected spawning areas, total return index, and maximum exploitation rate, 1974-1986.

	Alaska a			Canada b			Entire River					
Year	Comm	Subs	Total	Comm	Subs	Total	Comm	Subs	Total	Escapement Index c	Index of Return d	Maximum Exploit Rate e
1974	289,776	93,776	383,552	2,544	9,102	11,646	292,320	102,878	395,198	171,890	567,088	0.6969
1975	275,009	86,591	361,600	2,500	18,100	20,600	277,509	104,691	382,200	621,371	1,003,571	0.3808
1976	156,390	72,327	228,717	1,000	4,200	5,200	157,390	76,527	233,917	123,132	357,049	0.6551
1977	257,986	82,771	340,757	3,990	8,489	12,479	261,976	91,260	353,236	187,282	540,518	0.6535
1978	247,011	94,867	341,878	3,356	6,210	9,566	250,367	101,077	351,444	121,442	472,886	0.7432
1979	378,412	233,347	611,759	9,084	13,000	22,084	387,496	246,347	633,843	399,252	1,033,095	0.6135
1980	298,450	172,657	471,107	9,000	13,218	22,218	307,450	185,875	493,325	115,711	609,036	0.8100
1981	477,736	188,525	666,261	15,260	7,021	22,281	492,996	195,546	688,542	171,229	859,771	0.8008
1982	224,992	132,897	357,889	11,312	4,779	16,091	236,304	137,676	373,980	55,158	429,138	0.8715
1983	307,662	192,930	500,592	25,990	3,500	29,490	333,652	196,430	530,082	105,104	635,186	0.8345
1984	210,560	174,823	385,383	22,932	6,335	29,267	233,492	181,158	414,650	71,202	485,852	0.8534
1985	270,269	206,472	476,741	35,746	5,519	41,265	306,015	211,991	518,006	248,949	766,955	0.6754
1986	140,019	164,034	304,053	11,464	3,072	14,536	151,483	167,106	318,589	139,976	458,565	0.6948
1981-85 AVERAGE	298,244	179,129	477,373	22,248	5,431	27,679	320,492	184,560	505,052	130,328	635,380	0.8071

a Alaska commercial harvest includes "equivalent fish" converted from roe sales.
b Canadian subsistence includes the Indian food and domestic fisheries. Commercial and subsistence harvest data are preliminary for 1986.
c Escapement index is the sum of total season escapement to the Sheenjek, Fishing Branch, upper Toklat, and Delta Rivers. Sonar counts, weir counts, or multiple surveys and stream life factors were used where possible. Other historic survey count data for these spawning areas were expanded to population estimates based on these data. See Table 2 for stream-specific escapement information. This is only an index of escapement because several known fall chum salmon spawning areas are not included, due to the lack of an adequate historical data base.
d Sum of entire river commercial harvest, subsistence harvest, and the escapement index. This is only an index of total return since not all spawning populations are included in the escapement index.
e Sum of entire river commercial and subsistence harvest divided by the index of total return. This is a maximum estimate of harvest exploitation rate since the escapement index is a minimum estimate.

Appendix Table 36. Yukon River fall chum salmon expanded escapement population estimates for four selected spawning areas, 1974-1986.

	Escapement Population Estimates					Proportion of Total			
Year	Delta a	U Toklat b	Sheenjek c	Fish Br d	Total	Delta	U Toklat	Sheenjek	Fish Br
1974	5,915	43,484	89,966	32,525 w	171,890	0.03	0.25	0.52	0.19
1975	3,734 p	90,984	173,371	353,282 w	621,371	0.01	0.15	0.28	0.57
1976	6,312 p	53,882	26,354	36,584	123,132	0.05	0.44	0.21	0.30
1977	16,876 p	36,462	45,544	88,400	187,282	0.09	0.19	0.24	0.47
1978	11,136	37,057	32,449	40,800	121,442	0.09	0.31	0.27	0.34
1979	8,355	179,627	91,372	119,898	399,252	0.02	0.45	0.23	0.30
1980	5,137	26,373	28,933	55,268	115,711	0.04	0.23	0.25	0.48
1981	23,508	15,775	74,560	57,386 e	171,229	0.14	0.09	0.44	0.34
1982	4,235	3,601	31,421 s	15,901	55,158	0.08	0.07	0.57	0.29
1983	7,705	20,807	49,392 s	27,200	105,104	0.07	0.20	0.47	0.26
1984	12,411	16,511	27,130 s	15,150	71,202	0.17	0.23	0.38	0.21
1985	17,276 p	22,805	152,768 s	56,100 w	248,949	0.07	0.09	0.61	0.23
1986	6,703 p	18,903	83,197 s	31,173 w	139,976	0.05	0.14	0.59	0.22
1974-86 AVERAGE	9,946	43,559	69,727	71,513	194,746	0.07	0.22	0.39	0.32

a Total escapement estimates made from migratory time density curve (Barton 1986) unless otherwise indicated; (p) population estimate from replicate foot surveys and stream life data.

b Total escapement estimates using Delta River migratory time density curve and percentage of live salmon present by survey date in the upper Toklat River area.

c Total escapement estimates using sonar to aerial survey expansion factor of 2.221 unless otherwise indicated; (s) sonar estimate.

d Total escapement estimates using weir to aerial survey expansion factor of 2.72 unless otherwise indicated; (w) weir estimate.

e Initial aerial survey count was doubled before applying the weir/aerial expansion factor of 2.72 since only half of the spawning area was surveyed.

Table 37. Comparative Yukon River coho salmon escapement estimates, 1972-1986. a

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Nenana River															
Lost Slough	--	--	1,388	943	118	524	350	227	499	274	--	766	2,677	1,584	794
Clear Creek	--	--	--	--	13	--	--	--	--	--	--	--	2,600 b,c	--	605 b,c
Wood Creek b	--	--	--	--	--	310 d	300 d	--	1,603 d	849 e	1,436 e	1,044 e	8,805 e	3,775 e	1,664 e
Seventeen Mile Slough	--	--	27	956	281	1,167	466	1,987	592	1,005	--	103	--	2,081	218 b,c
Subtotal Nenana River	--	--	1,415	1,899	412	2,001	1,116	2,214	2,694	2,128	1,436	1,913	14,082	7,440	3,281
Delta Clearwater River c,f	632	3,322	3,954	5,100	1,920	4,793	4,798	8,970	3,946	8,563 g	8,365 g	8,019 g	11,061	5,358	10,857
Clearwater Lake and outlet	417	551 f	560	1,575 c,f	1,500 c,f	730 c,f	570 c,f	1,015 c,f	1,545 c,f	459 h	--	253	1,368	750	3,577
Richardson Clearwater River	454 h	375 f	652 f	4 h	80 h	327	--	372	611	550	--	88	428	--	146 h

a Peak aerial survey estimates rated fair to good unless otherwise indicated.
b F.R.E.D. Division data.
c Boat survey.
d Foot survey.
e Weir count
f Sport Fish Division survey
g Population estimate.
h Poor or incomplete survey.

Appendix Table 38. Associated environmental and salmon catch data, Yukon River, 1961-1986.

	Average Nome April Air Temp. (°F)	Nenana Ice Breakup, Tanana River	Iceout Yukon Delta Area	1st king salmon b/ caught Delta Area	1st king salmon b/ caught Kuskokwim River	1st king salmon caught Dist. 1 Comm. Fish.	1st summer chum b/ caught Delta Area	1st summer chum caught Dist. 1 Comm. Fish.
1961	18	5/5	a/	6/5	a/	6/5	a/	_
1962	18	5/12	6/10	6/7 c/	a/	6/11	a/	_
1963	18	5/5	5/29	a/	a/	6/3	a/	_
1964	13	5/20	>6/12	a/	a/	6/15	a/	_
1965	20	5/7	6/1	6/6	5/31	6/7	a/	_
1966	15	5/8	6/6	6/9	5/27 g/	6/10	a/	_
1967	23	5/4	a/	5/20	5/20	6/2	5/30	6/9
1968	14	5/8	a/	a/	5/26	6/3	6/5	6/7
1969	22	4/28	5/25	5/26	5/23	6/2	6/2	6/2
1970	15	5/4	"late May"	6/6	5/21	6/6	6/5	6/11
1971	13	5/8	6/5	6/11	6/6	6/11	6/15	6/15
1972	12	5/10	6/3	6/9	6/5	6/9	6/11	6/10
1973	18	5/4	6/1	5/30 d/	5/27	6/5	6/5	6/7
1974	21	5/6	"late May"	5/27	5/23	6/3	6/1	6/3
1975	13	5/10	6/1	6/1	5/26	6/9	6/13	6/13
1976	10	5/2	6/1	6/12	6/1	6/14	6/13	6/14
1977	9	5/6	6/1	6/9	5/31	6/11	6/11	6/13
1978	25	4/30	5/20	5/26	5/18	6/8	5/26	6/8
1979	26	4/30	5/20	5/24	5/16	6/4	5/28	6/4
1980	24	4/29	5/19	5/27 e/	5/17	6/9	5/31	6/9
1981	24	4/30	5/18	5/25	5/22	6/5	5/28	6/5
1982	12	5/10	6/2	6/6	6/1	6/14	6/6	6/14
1983	25	4/29	5/21	5/25	5/23	6/9	5/30	6/9
1984	12	5/9	6/1	6/2 f/	5/25	6/18	6/8	6/8
1985	1	5/11	6/5	6/14	6/3	6/24	6/16	6/24
1986	12	5/8	6/1	6/6	5/29	6/14 h/	6/7	6/14

a/ Information not available.
b/ Subsistence or test net fishery.
c/ Caught 6/9 Mt. Village, back calculated arrival date to mouth.
d/ Caught 6/3 Pilot Station, back calculated arrival date to mouth.
e/ Caught 5/23 Marshall, back calculated arrival date to mouth.
f/ Caught 6/5 Pitkas Point, back calculated arrival date to mouth.
g/ Caught 6/1 Kalskag, back calculated arrival date to mouth.
h/ Special six inch maximum mesh size fishing period.

Appendix Table 39. Total catch and estimated catch of Western Alaska (including Canadian Yukon) chinook salmon (in thousands of fish) taken in Japanese high seas salmon gill net fisheries and total catch of chinook salmon taken in foreign and joint-venture trawl fisheries, 1964-1986.

	Japanese Mothership Gillnet		Japanese Landbased Driftnet		Japanese Total Gillnet		Bering Sea-Aleutian Area Trawl			Gulf of Alaska Trawl		
	Western Alaska		Western Alaska		Western Alaska			Joint			Joint	
Year	Origin	Total	Origin	Total	Origin	Total	Foreign	Venture	Total	Foreig	Venture	Total
1964	179	410	40	208	219	618						
1965	106	185	20	102	126	287						
1966	108	208	22	118	130	326						
1967	71	128	22	115	93	243						
1968	244	362	18	97	262	459						
1969	367	554	17	88	384	642						
1970	312	437	28	148	340	585						
1971	132	206	27	139	159	345						
1972	189	261	20	107	209	368						
1973	56	119	31	165	87	284						
1974	208	361	36	188	244	549						
1975	108	162	20	137	128	299						
1976	117	285	42	201	159	486						
1977	55	93	31	146	86	239				4.8		4.8
1978	36	105	63	210	99	315	39.1		39.1	a/		
1979	69	126	45	160	114	286	100.4		100.4	16.9	1.0	17.9
1980	416	704	22	160	438	864	113.2	1.9	115.1	31.6	0.2	31.8
1981	30	88	55	190	85	278	36.7	0.3	37.0	28.6	0.0	28.6
1982	45	107	41	165	86	272	13.9	1.7	15.6	a/	3.5	5.9
1983	31	87	44	178	75	265	9.8	0.5	10.3	5.9	9.4	9.4
1984	37	82	b/	92	b/	174	a/	a/	b/	11.1	63.2	74.3
1985	25	66	b/	100	b/	166	b/	b/	b/	0.3	13.6	13.6
1986	24	47	b/	77	b/	136	0.3	4.0 c/	4.3	b/	18.0	18.0

a/ Species composition unknown.

b/ Information not available.

c/ Longline harvest only, no trawling conducted in 1986.

Appendix Table 40. Commercial herring fishing data, Cape Romanzof District, 1980-1986.

	1986	1985	1984	1983 1/	1982	1981	1980
Catch (st)	1,865	1,299	1,185	816	657	720	611
Hours Fished	42	90	90	144	180	130	312
Percent Roe Recovery	9.2	8.3	8.6	9.0	9.3	8.0	9.8
Estimated Value ($ millions)	1.14	0.55	0.31	0.37	0.22	0.21	0.13
Number of Buyers	5	2	3	3	2	4	2
Number of Fishermen	97	73	66	63	75	111	69
Percent Effort by Local Fishermen	84	91	98.5	92	85	81	70
Percent Harvest by Local Fishermen	70	94	99.8	88	84	60	40
Biomass Estimate 2/	7,500	7,000	6,100	5,500	4,900	4,900	3,000
Exploitation Rate	24.9	18.6	19.4	14.8	13.4	14.7	20.4

1/ Exclusive Use Regulation into effect.

2/ Biomass estimate is qualitative estimate of herring abundance to describe abundance trends
Methods not currently available to accurately judge biomass.

Appendix Table 41. Subsistence herring harvest (st) and effort data, Cape Romanzof, 1975-1986.

Year	Scammon Bay	Chevak	Hooper Bay	Total	Number of Fishing Families
1975	-	-	3	3	34
1976	1	1	3	5	41
1977	-	<1	2	<3	30
1978	1	-	4	5	29
1979	6	2	3	11	84
1980	3	4	4	11	61
1981	8	2	4	14	46
1982	4	2	5	11	43
1983	3	1	5	9	37
1984	4	3	4	11	47
1985	2	2	4	8	44
1986	2	1	4	7	41

1/ Subsistence survey results are believed to accurately reflect harvest trends, however, reported catches reflect minimum figures since all fishermen cannot be contacted.

Appendix Table 42. Colville River commercial whitefish catches, 1964-1986.

Year	Broad Whitefish	Humpback Whitefish	Arctic Cisco ("kaktok")	Least Cisco ("herring")
1964	2,951 1/		16,000	9,000
1965	3,000 1/		50,000	
1966	2,500 1/		40,000	
1967	data not available			
1968	3,130		42,055	18,180
1969	data not available			
1970	2,080 1/		19,602	25,930
1971	3,815	132	38,016	22,713
1972	3,850	1497	37,333	13,283
1973	2,161		71,569	25,188
1974	3,117	2,316	35,601	13,813
1975	2,201	1,946	28,291	20,778
1976	2,172	1,815	31,659	34,620
1977	443	1,431	31,796	14,961
1978 2/	20 3/	1,102	17,292	21,589
1979	3/	1,831	8,684	24,984
1980	3/	4,231	14,657	31,459
1981	1,035	469	38,206	16,584
1982	1,662	201	15,067 4/	25,746 4/
1983	3/	408 3/	18,162	35,322
1984	789	179	27,686	13,076
1985	401	191	23,679	17,595
1986 5/		18	29,895	9,444

1/ Includes small numbers of humpback whitefish.
2/ Also reported taken were 1 chinook, 2 sockeye, 9 chum, and 118 pink salmon.
3/ No fishing effort during June or July.
4/ No fishing effort during November or December.
5/ No fishing effort during July or December.

Average weights: Broad whitefish 5.1 lbs.
Least cisco 0.9 lbs.
Arctic cisco 1.0 lbs.

Appendix Table 43. Commercial freshwater fishery catches, upper Yukon area, 1971-1986.

	Healy Lake		Lake Minichumina		Tanana River		
	Whitefish		Whitefish		Burbot		Whitefish
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number
1971			3,277	9,831			
1972	2,605	3,950	718	2,154			
1973	2,187	3,915	1,697	5,037			
1974	1,885	3,390	854	2,562			
1975	1,357	2,375					
1976	1,440	2,625					
1977	-	-					
1978	-	-					
1979	1,336	2,306					
1980	data unavailable						
1981	no effort						
1982	no effort						
1983	no effort						
1984	no effort				-	76	
1985	no effort						
1986	no effort						72

Appendix Table 44. Commercial freshwater fishery catches, lower Yukon area, 1978-1986.

	Sheefish		Whitefish		Blackfish	Burbot		Pike	Lamprey
Year	Number	Pounds	Number	Pounds	Pounds	Number	Pounds	Pounds	Pounds
1978	-	-	19	87	-	-	-	-	-
1979	5	39	23	55	-	-	-	-	-
1980	283	2,265	78	250	293	-	-	-	-
1981	299	2,812	779	2,875	-	-	-	9	-
1982	754	6,161	1,633	6,214	-	102	482	-	-
1983	395	2,692	163	648	-	-	-	-	-
1984	94	762	794	2,362	-	-	-	-	-
1985	358	3,081	1,514	4,586	-	-	-	-	-
1986	-	-	1,533	5,845	-	-	-	-	80

Attachment 1. List of Yukon area emergency orders issued, 1986.

E.O. No.	Effective Date	Action Taken	Comments
3-Y-1-86	May 29	Establish the first commercial herring fishing period of 12 hours from 9:00 a.m. until 9:00 p.m. May 29 in the Cape Romanzof District.	Test fishing and spawning ground observations indicated mature herring available in harvestable numbers.
3-Y-2-86	May 30	Establish the second commercial herring fishing period from 10:00 a.m. until 10:00 p.m. May 30 in the Cape Romanzof District.	Spawn deposition surveys indicated continued spawning activity. Scale age analysis of test fish caught samples indicate that younger age herring make up approximately 30% of the total run.
3-Y-3-86	May 31	Establish the third commercial herring period from 6 a.m. until 12:00 p.m. May 31, in the Cape Romanzof District.	Spawning ground surveys, test fishing results, and above average commercial catch rates indicated a very high abundance of herring.
3-Y-4-86	June 14	Opens and closes the commercial salmon fishing season, restricts fishing gear to six inch maximum mesh size, and provides for 12 hour fishing periods in Districts 1 and 2. District 1 fishing to be allowed from 6:00 a.m. to 6:00 p.m. June 14. District 2 fishing from 6:00 a.m. to 6:00 p.m. June 15. Closure of commercial fishing season following these periods allows for continuous subsistence fishing.	Monitoring of subsistence and test net catch data indicate the chinook salmon run has yet to develop while the chum salmon run has developed rapidly indicating a run of exceptionally large magnitude.

Attachment 1. (continued)

3-Y-5-86	June 19	Open the commercial salmon unrestricted mesh size fishing season and establish fishing periods to allow for one day fishing to be followed by three days closed to fishing.	Monitoring of subsistence and test fishing data indicated increasing numbers of chinook salmon began entering the river after June 15. Given chinook salmon passage rates, a portion of the increased chinook salmon abundance will clear districts 1 and 2 prior to commercial fishing. The initial escapement will provide for a portion of spawning ground requirements and an opportunity for utilization by upriver subsistence fishermen.
3-Y-6-86	June 20	Opens the commercial salmon fishing effective 12:00 noon p.m. June 21 in District 2 of the Yukon area. This precedes the commercial salmon fishing season opening established by E.O. 3-Y-05-86 by 30 hours. Additionally, this E.O. establishes a commercial salmon fishing period in District 2 from 12:00 noon p.m. until 6:00 p.m. with the use of 6 inch or smaller mesh size gillnets.	Department test gillnet catches and sonar counts indicated that the summer chum salmon run into the Yukon River was above average magnitude. Allowing utilization of 6 inch maximum gear for a 12 hour fishing period will provide for increased harvest of surplus summer chum salmon and minimize the incidental catch of chinook salmon.
3-Y-7-86	June 24	Establish a 6 hour commercial salmon fishing period from 6:00 p.m. until 12:00 midnight a.m. on June 24, allowing only the use of 6 inch or smaller mesh gillnets in District 2 of the Yukon area.	Summer chum salmon run strength continues to be well above average. Test fishing data substantiates a run of exceptionally large magnitude.

Attachment 1. (continued)

3-Y-8-86	June 25	Establish a 12 hour summer chum salmon directed fishing period from 6:00 p.m. June 25 until 6:00 a.m. June 26 allowing only the use of 6-inch or smaller mesh size gillnets in District 1 of the of the Yukon area.	Test gillnet catches and relatively large commercial catches during unrestricted mesh size periods indicate a high abundance of summer chum salmon.
3-Y-9-86	June 26.	Opens the commercial salmon fishing season in District 3 of the Yukon area and establishes a fishing period from 6:00 p.m. June 26 to 6:00 p.m. June 27.	The early portion of the Yukon River chinook salmon run appears to be at least average in magnitude. The chinook salmon run appears to be well distributed throughout the lower 300 miles of the district.
3-Y-10-86	June 27	Establish special 24 hour subsistance fishing periods every other weekend during commercial salmon fishing closures in Districts 1 and 2 through July 19.	Special subsistence fishing periods established by emergency order as stipulated by regulation to provide for increased subsistance fishing opportunities.
3-Y-11-86	June 27	Voids scheduled fishing periods established by E.O. 3-Y-05-86 and establishes a single unrestricted mesh size fishing period for District Y-1 from 6:00 p.m. June 29 to 6:00 p.m. June 30.	To assure adequate escapement from the middle portion of the chinook salmon run, a delay in the opening of the next unrestricted mesh size commercial fishing period was warranted.
3-Y-12-86	July 1	Establishes 24 hour unrestricted mesh size commercial salmon fishing periods from 6:00 p.m. July 1 to 6:00 p.m. July 2, in Districts 2 and 3 of the Yukon area.	Based on comparative catch data the chinook salmon run appears to be average or slightly above average in magnitude, justifying a harvest goal of near the midpoint of the guideline harvest ranges.

Attachment 1. (continued)

3-Y-13-86	July 2	Establishes a 12 hour summer chum salmon directed commercial fishing period from 6:00 a.m. July 2 until 6:00 p.m. July 2, allowing the use of 6-inch or smaller mesh gillnets in District 1 of the Yukon area.	The summer chum salmon run continues to be of exceptionally large magnitude based on evaluation of test fishing data, sonar enumeration and tower counts.
3-Y-14-86	July 3	Establishes the fourth 24 hour unrestricted mesh size period in District 1 from 6:00 p.m. July 3 until 6:00 p.m. July 4.	Based on comparative catch data the chinook salmon run appears to be average to slightly above average in magnitude, justifying a harvest goal toward the midpoint of the guideline harvest range.
3-Y-15-86	July 3	Establishes a 12 hour chum salmon directed commercial fishing period from 6:00 p.m. July 3 until 6:00 a.m. July 4 allowing only the use of 6 inch or smaller mesh size gillnets in District 2 of the Yukon area.	The summer chum salmon run continues to be of exceptionally large magnitude based on evaluation of test fishing data, sonar enumeration and tower counts.
3-Y-16-86	July 6	Establishes the fourth 24 hour unrestricted mesh size gillnet period in District 2 from 6:00 p.m. July 6 until 6:00 p.m. July 7.	Based on comparative catch data the chinook salmon run appears to be average to slightly above average in magnitude justifying a harvest goal toward the midpoint of the guideline harvest range.
3-Y-17-86	July 6	Establishes a 24 hour unrestricted mesh size fishing period in District 3 of the Yukon area from 6:00 p.m. July 6, to 6:00 p.m. July 7.	Provides fishermen the opportunity to approach the lower end of the guideline harvest range. It is anticipated the harvest will not acheive the lower end of the guideline harvest range due to low effort and lack of readily available buyers.

Attachment 1. (continued)

3-Y-18-86	July 7	Closes the commercial salmon fishing season in District 3 of the Yukon area effective 6:00 p.m. July 7.	As ample commercial fishing opportunity has been made available to fishermen interested in tendering their catches a long distance the closure of the commercial fishery is warranted.
3-Y-19-87	July 7	Establishes two 24 hour weekly fishing periods in Districts 1 and 2. In addition, this E.O. allows the taking of salmon for commercial purposes with only gillnets of six inch or smaller.	A change over to gillnets of 6 inch or smaller mesh is warranted as the midpoint of the chinook guideline harvest level has been achieved. A restriction of small mesh size fishing gear will direct the harvest toward summer chum salmon. An additional harvest of 5,000 to 10,000 chinook salmon is expected during the restricted mesh size periods.
3-Y-20-86	July 7	Prohibits subsistence fishing for salmon by commercial fishermen with gillnets of 6 inch or larger mesh size after July 7 in District 1 and after July 9 in District 2.	Action taken to prevent chinook salmon from being taken under guise of subsistence fishing from entering commercial channels.
3-Y-21-86	July 11	Close subdistricts 5-A, 5-B, and 5-C to commercial salmon fishing.	Midpoint of chinook salmon harvest guideline range was met.
3-Y-22-86	July 14	Close Districts 1 and 2 to commercial fishing.	Action taken in accordance with Yukon River Fall Chum Salmon Management Plan.
3-Y-23-86	July 17	Close District 6 to commercial salmon fishing	Guideline harvest range for chinook salmon in the district was met.

Attachment 1. (continued)

3-Y-24-86	July 19	Close subdistrict 5-D to commercial salmon fishing.	Midpoint of chinook salmon guideline was met.
3-Y-25-86	July 25	Re-open District 6 to commercial salmon fishing.	Majority of chinook salmon run has passed. Season re-opened to harvest large summer chum run in progress.
3-Y-26-86	August 1	Close subdistricts 4-B and 4-C of District 4 to commercial salmon fishing.	Action taken to protect early portion of fall chum salmon run from commercial exploitation until run strength could be evaluated.
3-Y-27-86	August 4	Opens the commercial salmon fishing season in Districts 1 and 2 and establishes a single period in each district.	Evaluation of fall chum salmon run strength indicates harvestable surplus available.
3-Y-28-86	August 7	Established second fishing period in District 1.	Fall chum run appears to be maintaining strength.
3-Y-29-86	August 8	Established 24-hour subsistence fishing periods each weekend during the commercial salmon fishing season in Districts 1 and 2.	Regulations require this action by emergency order.
3-Y-30-86	August 10	Opened District 3 to commercial fishing and established fishing periods in Districts 2 and 3.	Run strength appears to be average. Additional fishing required to provide harvest toward upper end of guideline harvest range.
3-Y-31-86	August 13	Closed commercial salmon fishing season in District 6.	Summer chum run essentially over. Fall chum run not yet present.
3-Y-32-86	August 11	Closed commercial salmon fishing season in District 3 above Paimuit.	Action to allow uninterrupted subsistence fishing within this area.

Attachment 1. (continued)

3-Y-33-86	August 14	Established an additional fishing period in District 1, 2, and 3.	Run strength appears to be above average.
3-Y-34-86	August 12	Established an additional fishing period in Districts 1, 2, and 3.	Run strength appears to be above average.
3-Y-35-86	August 14	Extention of commercial salmon fishing periods established in E.O. 3-Y-33-87.	Fall chum salmon run strength continues to appear above average with increased numbers of coho salmon present.
3-Y-36-86	August 15	Established a 24-hour subsistence fishing period each weekend during the commercial salmon fishing season in that portion of District 3 below Paimuit.	Regulations require this action by emergency order.
3-Y-37-86	August 19	Re-open the commercial salmon fishing season in District 5.	Fall run chum salmon are present in commercially harvestable numbers. A limited commercial harvest is warranted.
3-Y-38-86	August 18	Established an additional fishing period in District 1, 2, and 3.	Run timing information indicates 80% of the fall chum salmon run is past the lower river. Periods established to provide for a fall chum salmon harvest near the upper end of the harvest guideline.
3-Y-39-86	August 24	Establish a 36-hour commercial fishing period in subdistrict 5-A, 5-B, and 5-C of District 5.	Run strength, as evidenced by catches during previous commercial fishing period, sufficient to allow additional harvest.

Attachment 1. (continued)

3-Y-40-86	August 24	Establish a 24-hour commercial fishing period in subdistricts 5-A, 5-B, and 5-C of District 5.	All indicators of run strength (commercial catches, test-fish catches, subsistence catches, and main-river sonar counts) suggest that run strength is sufficient to allow additional commercial harvest.
3-Y-41-86	August 24	Closed commercial salmon fishing in Districts 1, 2, and 3.	Harvest to reach upper end of guideline harvest range by end of scheduled periods.
3-Y-42-86	August 30	Establish a 24-hour commercial fishing period in subdistricts 5-A, 5-B, and 5-C of District 5.	One additional commercial fishing period will increase the cumulative harvest in these areas from approximately 15,000 to 22,000-25,000 fall chum salmon. Run strength estimates suggest that a commercial catch in this range is commensurate with run strength.
3-Y-43-86	Sept. 5	Close the commercial salmon fishing season in subdistricts 4-B and 4-C of District 4.	To date, no commercial processors have operated in this district and catcher-processors in this area are no longer operating.
3-Y-44-86	Sept. 9	Close the commercial salmon fishing season in subdistrict 5-D of District 5.	Current commercial catch of fall chum salmon is estimated to be 1,350 fish. There has been no repeated commercial harvest in this area since 8/31 and no prospect of additional commercial activity.

Attachment 1. (continued)

3-Y-45-86	Sept. 12	Re-open the commercial salmon fishing season in District 6.	The fall chum and coho salmon run in the Tanana River is in progress and a limited test opening is warranted to determine run strength.
3-Y-46-86	Sept. 23	Close the Kantishna River drainage to subsistence fishing for salmon.	Available information suggests a poor return of fall chum salmon to the Kantishna River. A closure of that fishing is necessary to attempt to secure adequate numbers of fish on spawning grounds.

Attachment 2. Summary of 1986 Yukon area commercial and subsistence fishing regulations promulgated by the Alaska Board of Fisheries during November, 1985 meeting in Anchorage.

Section	Action Taken
5AAC 05.365. YUKON RIVER FALL CHUM SALMON MANAGEMENT PLAN.	Reduction of fall chum salmon guideline harvest ranges to 0 - 160,250 fish, this represents a 50% reduction of the previous upper end of the guideline harvest range. Additionally, establishes closure of District 1,2 and 3 fisheries on July 15 and provides the Department authority to establish weekly fishing periods by emergency order in Districts 4,5 and 6.
5AAC 01.240 (b) MARKING OF SUBSISTENCE TAKEN SALMON.	Requires that salmon caught for subsistence purposes during open commercial periods in Subdistricts 5-A, 5-B, 5-C and a portion of 5-D have their dorsal fin immediately removed.

Attachment 3. Summary of special projects conducted in the Yukon Area, 1986.

1. LOWER YUKON TEST FISHING

a. Location:

1) Big Eddy Test Fishing Project: Kwikluak Pass near Emmonak (South Mouth of the Yukon River Delta).

2) Middle Mouth Test Fishing Project: Kawanak and Apoon Passes (middle and north mouths of Yukon River Delta).

b. Objectives: To determine run timing, distribution and relative abundance of chinook, summer chum, fall chum and coho salmon in the lower Yukon River using set gill nets.

c. Results:

1) Big Eddy Test Fishing Project:

a) CHINOOK AND SUMMER CHUM SALMON: Index set nets for chinook and summer chum salmon were operated from June 5 to July 15. A total of 1,267 chinook and 8,500 summer chum salmon were captured. The chinook salmon catch was similar to 1985. The mean date (the date on which statistically the central point of the migration passed the test fishery) for chinook salmon was calculated to be June 22. The mean date for summer chum salmon was June 20. This was the third consecutive year of large summer chum run magnitude.

b) FALL CHUM AND COHO SALMON: Index set nets for fall chum and coho salmon were operated from July 16 until August 28. A total of 2,542 fall chum and 274 coho salmon were taken. Fall chum salmon catches increased substantially from 1984 and 1982 levels. Coho salmon catches were the lowest since the project

was initiated in 1977. This was partially attributed to the small size of returning coho salmon which affected mesh selectivity. Test fishing data indicated mean dates of July 29 and August 18 for fall chum and coho salmon, respectively.

2) Middle Mouth Test Fishing Project:

a) CHINOOK AND SUMMER CHUM SALMON: Index set nets for chinook and summer chum salmon were operated June 8 until July 15. A total of 1,498 chinook and 1,331 summer chum were captured. Chinook salmon catches were up from 1985. The mean date of migration was June 22. Summer chum salmon catches were down from 1984 and 1985 levels. The mean date for summer chum salmon was June 25.

b) FALL CHUM AND COHO SALMON: Three index set nets for fall chum and coho salmon were fished from July 16 until August 27. A total of 4,418 fall chum and 485 coho salmon were captured. Fall chum salmon catches increased significantly from 1984 and 1985. The coho salmon catch was down substantially from 1983 and 1984. The mean dates of migration were calculated to be August 2 and August 18 for fall chum and coho salmon, respectively.

2. UPPER YUKON RIVER TEST FISHING

a. Location:

1) Ruby: North bank of Yukon River approximately 21 miles upstream from Ruby (site 2) and south bank of Yukon River approximately 24 miles upstream from Ruby.

b. Objectives: To determine run timing and relative abundance of fall chum and coho salmon at the Ruby sampling locations.

c. Results:

1) FALL CHUM AND COHO SALMON: At site 2, (south bank near Ruby) the fishwheel was operated from August 5 through September 13. A total of 12,379 chum salmon and 2,409 coho salmon was taken, and the chum salmon run, as evidenced by fishwheel catches, peaked during the period August 4 - 6 providing outstanding catches from August 31 through the end of the project.

2) The Ruby area north bank test fishwheel was run from August 2 through September 7. During that time, a cumulative total of 3,618 chum salmon was caught and the timing was bimodal with peaks occurring during the periods August 5 - 7 and August 24 through August 27.

3. YUKON RIVER SONAR

a. Location: River mile 123, approximately one mile upstream of Pilot Station.

b. Objectives:

1) Estimate the number of hydroacoustic targets passing the sonar site.

2) Determine the species composition of the targets using gillnets of six different mesh sizes.

3) Produce confidence intervals for estimates of fish passage.

4) Monitor migratory run timing based on test fish catch per unit effort (CPUE) data.

c. Results: In 1986, a total of 4,083,224 fish passed the sonar site between June 9 and September 12. The majority, 74 percent, passed along the south bank while the remaining 26 percent passed along the north bank. The total count was partitioned to species as follows:

86,449 chinook salmon; 1,943,558 summer chum salmon; 526,814 fall chum salmon; 1,055,746 pink salmon, 199,798 coho salmon; and 270,918 "other species" which includes whitefish, burbot, sheefish and northern pike.

4. SUBSISTENCE SALMON FISHERY SURVEYS

a. Location: Yukon, Koyukuk and Tanana Rivers and Yukon Territory villages.

b. Objectives: Determine subsistence utilization of salmon and fishing effort needed for formulating future management procedures and goals.

c. Results: A total of 1,186 fishing families were surveyed in the Yukon River drainage and their catches totaled 54,549 chinook salmon and 492,764 other salmon. Catch and effort information was obtained by personal interviews and catch questionnaires. Yukon Territory subsistence catch data was furnished by Government of Canada-Department of Fisheries and Oceans (Whitehorse).

5. COMMERCIAL AND SUBSISTENCE SALMON CATCH SAMPLING

a. Location: Emmonak, St Marys, Marshall, Galena, Rampart, Nenana, and Fairbanks.

b. Objectives: Obtain age, sex, and size composition estimates for chinook, summer chum, fall chum, and coho salmon harvests in the major commercial and subsistence fisheries on an in-season and post-season basis. Also, provide scale samples of chinook and fall chum salmon to the stock identification research projects for catch allocation of these species to stock of origin based on scale patterns analysis.

c. Results: Approximately 6,000 chinook salmon, 4,000 summer chum salmon, 1,700 fall chum salmon, and 600 coho salmon were sampled from commercial and subsistence fishery harvests in 1986. Preliminary age and sex composition estimates for the lower river commercial fishery were

obtained on an in-season basis for harvest regulation purposes. Samples from upper river fisheries were aged on a post-season basis. Age, sex, and, size composition data are being compiled and are not yet available.

6. CHINOOK SALMON STOCK BIOLOGY

a. Location: Commercial and subsistence fishery catch samples were obtained from Districts 1, 2, 4, 5, and 6, and test fishery catch samples were obtained from District 1 as outlined in catch sampling and test fishing project summaries. Escapement carcass samples were collected from the Andreafsky, Anvik, Nulato, South Fork Koyukuk, Jim, Chena, and Salcha Rivers in Alaska, and from the Nisutlin, Big Salmon, Little Salmon, Teslin, and mainstem Yukon Rivers in Yukon Territory. Additional catch and escapement samples from the Yukon Territory were provided by the Canadian Department of Fisheries and Oceans.

b. Objectives: Allocate Yukon River commercial and subsistence chinook salmon harvests to stock region of origin by fishing district and time period based on scale patterns analysis. Assess the quality of spawning escapements in terms of potential productivity, and monitor the effects of harvest management strategy on spawning escapements by stock.

c. Results: All escapement samples and those catch samples not aged during the season were aged on a post-season basis. Age, sex, and size composition data are being compiled, and are not yet available. Scale patterns from approximately 3,500 chinook salmon catch and escapement samples were analyzed using a computer based digitizing station. These scale measurements will be used to build stock identification models for allocation of the Yukon River fishery harvests to stock region of origin. These data are not yet available.

7. FALL CHUM SALMON STOCK BIOLOGY

a. Location: Commercial and test fishery catch samples were obtained from Districts 1 and 4 as outlined in catch sampling and test fishing

project summaries. Escapement samples were collected from the Sheenjek, Toklat, and Delta Rivers in Alaska as outlined in escapement project summaries. Additional catch and escapement samples from the Yukon Territory were provided by the Canadian Department of Fisheries and Oceans.

b. Objectives: Investigate the feasibility of discriminating stocks or stock groupings of Yukon River fall chum salmon based on scale patterns analysis. If feasible, then allocate Yukon River District 1 commercial and test fishery catches and the District 4 test fishery catch to stock region of origin based on scale patterns analysis.

c. Results: All catch and escapement samples not aged during the season were aged on a post-season basis. Age, sex, and size composition data are being compiled, and are not yet available. Fall chum salmon scale patterns from escapement samples were analyzed using a computer based digitizing station. These scale measurements will be used to build stock identification models for allocation of the Yukon River fishery harvests to stock region of origin if justified by the levels of accuracy and precision that can be obtained. These data are not yet available.

8. ANDREAFSKY RIVER SALMON ESCAPEMENT STUDY

a. Location: River mile 20 of the East Fork Andreafsky River.

b. Objectives: Enumerate summer chum, chinook, and pink salmon escapement to the East Fork Andreafsky River on a daily basis by visually counting fish passage from a counting tower. Collect chum and chinook salmon samples by beach seine for age, sex, and size composition estimates. Additional chinook salmon samples were collected by carcass survey under the Chinook Salmon Stock Biology Project.

c. Results: Salmon escapement counting was conducted from 25 June through 14 July. Counting had been scheduled to continue through 28 July, but was terminated early due to emergency budget reductions. The cumulative chum salmon count through 14 July of 152,730 fish was expanded to a total season estimate of 167,614 fish based on historic daily escapement timing patterns. The expanded estimate of 167,614 summer chum salmon is the second largest for the East Fork Andreafsky River since total population estimates have been obtained beginning in 1981, and is 32% greater than the 1981-1984 average sonar estimate of 127,349 fish. Escapement counts of 1,530 chinook salmon and 124,618 pink salmon through 14 July could not be expanded to total season escapement estimates due to the lack of daily escapement timing data for these species. Chinook and pink salmon timing is later than that for chum salmon in this system, and it is therefore not appropriate to use the same expansion factor as was used for chum salmon.

Chum salmon age composition for 775 ageable samples was 61% age 4, 37% age 5, 1.7% age 6, and 0.3% age 3. Females accounted for 55% of the sample. Chinook salmon age composition for 275 ageable samples was 70% age 5, 22% age 6, 6% age 7, and 2% age 4. Females accounted for only 23% of the sample.

9. ANVIK RIVER SALMON ESCAPEMENT STUDY

a. Location: River mile 48 of the Anvik River.

b. Objectives: Enumerate summer chum salmon escapement to the Anvik River on a daily basis using side-scanning sonar. Collect chum and chinook salmon samples by beach seine for age, sex, and size composition estimates. Additional chinook salmon samples were collected by carcass survey under the Chinook Salmon Stock Biology Project.

c. Results: Salmon escapement counting was conducted from 21 June through 15 July. Counting had been scheduled to continue through 28

July, but was terminated early due to emergency budget reductions. The cumulative chum salmon count through 15 July of 1,085,750 fish was expanded to a total season estimate of 1,189,602 fish based on historic daily escapement timing patterns. The expanded estimate of 1,189,602 summer chum salmon is second only to the 1981 escapement of nearly 1.5 million fish, and is 2.4 times greater than the escapement objective of 487,000 fish.

Chum salmon age composition for 486 ageable samples was 68% age 5, 30% age 4, 1.4% age 6, and 0.4% age 3. Females accounted for 58% of the sample. Chinook salmon age composition for 142 ageable samples was 50% age 5, 38% age 6, 11% age 7, and 1% age 4. Females accounted for 63% of the sample.

10. SHEENJEK RIVER ESCAPEMENT STUDY

a. Location: Rivermile 6 of the Sheenjek River.

b. Objectives: Determine timing and magnitude of salmon escapement to this river and collected salmon age, sex, and size information.

c. Results: The sonar-estimated escapement to the Sheenjek River in 1986 was 83,197 fall chum salmon for the period August 17 through September 24. It was fortunate that project start-up was approximately 14 days earlier than in the preceding 5 years as the fall chum salmon run was early in 1986. Mean date of run passage was September 3.

Fall chum salmon age composition was 8% age 3, 41% age 4, 50% age 5, and 1% age 6. All ages in 1986 were determined from vertebrae. A total of 450 chums was also sampled for scales which would subsequently be analyzed as part of a fall chum salmon stock composition study. In addition, body parts were collected from 150 chum salmon for subsequent electrophoretic analysis.

11. CHANDALAR RIVER ESCAPEMENT STUDY

(Conducted by U.S. Fish and Wildlife Service)

a. Location: Rivermile 13 of the Chandalar River.

b. Objectives: Determine timing and magnitude of salmon escapement to this river and collected salmon age, sex, and size information.

c. Results: The sonar-estimated escapement to the Chandalar River in 1986 was 59,313 fall chum salmon for the period August 9 through September 14. Mean date of run passage was September 1. Otoliths were collected to determine age.

12. DELTA RIVER ESCAPEMENT STUDY

a. Location: Lower mile of the Delta River.

b. Objectives: Determine timing and magnitude of salmon escapement to this river and collect salmon age, sex, and size information.

c. Results: A total season population estimate of 6,703 fall chum salmon was made for this river in 1986. The population estimate was generated from replicate (9) foot surveys conducted throughout the period September 30 to November 26 and spawner residence time data collected in the Delta River in 1973 and 1974.

Fall chum salmon age composition was approximately 8% age 3, 77% age 4, and 15% age 5. Less than 1% were age 6. All age determinations were made from vertebrae. A total of 150 fish were also collected and sampled for subsequent electrophoretic analysis, and 450 chums were sampled for scales to be subsequently analyzed in a stock composition study.

13. CHENA RIVER CHINOOK SALMON STUDY

a: Location: Chena River (Tanana River drainage).

b. Objectives: Determine the timing and magnitude of the Chena River chinook salmon escapement using tag and recapture methods. Estimate stream life of chinook salmon in this stream and collect salmon age, sex, and size information.

c. Results: Gillnets (two mesh sizes) were fished at rivermile 16 to collect chinook salmon for tagging. A total of 529 chinook and 337 summer chum salmon were captured from July 2-23. A total of 515 chinook salmon were tagged (jaw tags). Subsequent carcass surveys resulted in 57 rag recoveries. Based upon goodness-of- fit tests (Chi-square) no significant difference was detected between the rate of recovery among length categories or between sexes. A preliminary population estimate of Chena River chinook salmon was 10,734 using only recovery data from August 1-9, the period for which no significant differences in recovery rate could be detected.

The chinook salmon male to female ratio based upon carcass samples was approximately 1.0:0.3. Chinook salmon age composition was dominated by approximately 70% age 5 fish (1981 brood year returning as 1.3's). Next in abundance (22%) were age 6 fish (1980 brood year) returning primarily as 1.4's. The 1979 brood year was represented by approximately 6% age 7 fish which were dominated by 1.5's.

14. HOOPER BAY SALMON TAGGING STUDY
(Conducted by Bering Sea Fishermen's Association)

a. Location: Hooper Bay and Hazen Bay.

b. Objectives: Determine spawning origins of the annual Hooper Bay chum salmon run, and to gain information on run timing of chum and pink salmon.

c. Results: A total of 1,927 chum salmon were tagged from June 9 to July 17, predominately in the Hooper Bay area. By October 20, 1986 141

tags had been recovered, the majority of the recoveries were made within the Yukon River. Pink and chum salmon catches in tagging locals occurred simultaneously indicating there is no period during which pink salmon could be harvested without capture of significant numbers of chum salmon.

15. CAPE ROMANZOF HERRING PROJECT

a. Location: Kokechik Bay and Scammon Bay.

b. Objectives: Determine distribution, timing and relative abundance of spawning herring and collect information on spawn deposition. Collect age, sex and size composition, fecundity data and relative maturity information of herring from test fishing and commercial catches.

c. Results: The herring biomass was estimated to be approximately 7,500 st based on test fishing study results, commercial harvest rates, and preliminary spawn deposition study findings. A total of 1,180 herring were samples from test variable mesh and commercial gillnets. Test net catches indicates over 70% of the biomass were age 7 and older herring. Ground surveys indicated that primary spawn deposition occurred from May 23-June 4. In general spawn deposition extent and intensity appeared comparable to that documented during 1983-1985.